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SCIATICA: ITS CAUSES AND TREATMENT.[1]

By ALEXANDER JUETT, F.R.A.C.S.,
Perth, Western Australia.

SCIATICA is understood to mean pain in the course of the sciatic nerve and its branches and may arise from a multitude of conditions. Many of these conditions produce pathological changes in the nerve or its sheath primarily or secondarily and at different levels; other conditions, without inducing evident changes in the nerve, cause their pain impulses to be referred to this nerve and its branches.

Causes of Sciatica.

Advance in our knowledge of sciatica in the last fifty years has been the demonstration that protrusion of the intervertebral disk into the spinal canal is a fairly common cause of sciatica and that subluxation of the sacro-iliac joint may give rise to sciatic pain. These are definite gains in knowledge of causes. Epidural injection of "Novocain" and saline solution, and improvements in laminectomy technique and diagnostic methods are other gains.

The mechanism of referred pain and overflow of painful impulses has received many explanations. Head's theory that "painful impulses proceeding from an area of lowered sensibility are referred to an area of increased sensibility" helps to explain the inaccurate localization of the origin of the pain in sciatic neuralgia.

One of the worst cases of sciatic pain I have encountered was one in which the small sciatic nerve had been picked up in the skin sutures of an incision to remove a foreign body from the back of the thigh in its upper third. The patient was thought to be suffering from neurasthenia. The sciatic nerve was normal. Resection of three inches of neuromatous small sciatic nerve caused immediate relief and enabled the man to return to a training battalion in three weeks.

In a similar fashion resection of a scarred portion of the lesser cutaneous nerve relieved severe median nerve neuralgia.

The patient usually makes the diagnosis of sciatica and challenges the doctor first to relieve the pain, and then to restore efficiency. Relief of pain is the immediate essential in acute cases and restoration of efficiency requires what may prove to be a tedious and careful search for the predisposing and exciting causes of the pain. The cause of the sciatica in a given case is not fully established until all other causes have been eliminated. The causes may be constitutional or local and are often a combination of both. This fact makes necessary a careful history, especially as to onset, and also a complete general and local examination.

In the constitutional group of causes are to be included poisoning by arsenic, lead and alcohol, and focal sepsis from teeth, tonsils, intestines and the uro-genital tract including the prostate. Metabolic disturbances—for example, gout—and vitamin and perhaps mineral deficiency, diabetes and syphilis help to fill the list. Constitutional causes may affect the nerve directly, causing radiculitis, neuritis and perineuritis, or indirectly by first affecting the muscles, ligaments and joints in the lumbo-sacral, sacro-iliac and hip joint areas; thence the effect extends to the nerve and its sheath or gives rise to referred pain from these areas (the so-called sciatic neuralgia).

The local group of causes is a large one; they may affect the nerve directly or indirectly at any level in its course—

[1] Read at the annual meeting of the Australian Orthopædic Association, October, 1941.

spinal, pelvic, femoral or crural. Direct local causes are those that affect the nerve by pressure, stretching or the extension of an inflammatory process to the nerve or its sheath. Indirect local causes are those that cause sciatic pain without accompanying pathological changes in the nerve. This group includes muscular, ligamentous and joint inflammations, injuries, congenital anomalies, postural defects *et cetera* involving the lumbo-sacral and sacro-iliac joints or the articular facets of the lower lumbar vertebræ. In many cases of this group the basic cause may be constitutional.

Causes may be considered as neural, juxtaneural and extraneural, and further classified according to the level whence the pain arises, as spinal, pelvic, femoral and crural.

The history taking and general examination, which often have to be completed in successive stages, give valuable positive or negative information. These and the local examination require good team work. Good radiological work is essential in every case.

The ankle and knee jerks are tested, and on the assumption that the pain is confined to the sciatic nerve distribution, the ankle jerk on the affected side will either remain unchanged, gradually lessen and disappear, or disappear rapidly within a few days of the onset of the pain. Rapid disappearance is the rule when the sciatica is a primary neuritis of toxic origin or results from rapid extension to the sheath from fibrositis; and also when direct injury to the nerve has occurred. Gradual disappearance of the ankle jerk indicates involvement of the nerve and sheath from juxtaneural causes, and this has been my experience in the cases of herniation of the *nucleus pulposus*, thickened *ligamentum subflavum* and arachnoiditis I have encountered.

Postural defects which do not produce sciatic pain are common; but they are frequent accompaniments of sciatica both before and after the attack. The effect of these defects is well known to you.

Inequality in the length of the legs is more common than is thought, and in the case of workers who complain of strained back this can cause confusion. The pain is gradual in onset, works up to a maximum, is localized to the lumbo-sacral and sacro-iliac areas and may be accompanied by sciatic pain. The tilting of the pelvis and the results of tests strongly suggest sacro-iliac subluxation; but in these cases both the anterior superior and posterior superior iliac spines are higher on one side than on the other, and not, for example, right anterior up and right posterior down, left anterior down and left posterior up, as in sacro-iliac subluxation. The difference in length may be three-quarters of an inch. Rest, heat and massage followed by balancing of the boots give fairly quick relief. It appears that the muscles have been able to compensate for years, but finally the compensation breaks down owing to unfair wear and tear. Change of occupation is advisable. I have encountered two such cases in the last few months.

Points of tenderness in the course of the nerve occur in sciatic neuritis and give no indication of the level of origin, since they are found in cases due to root pressure from disk protrusions as well as in those of toxic origin.

Lasègue's sign is present when the sciatic nerve is painful and also when there is painful involvement of the sacro-iliac joint or the long sacro-sciatic ligament. Hip joint tests may be performed without stretching of the sciatic nerve and should not be forgotten. Lumbo-sacral and sacro-iliac tests, a search for fibrositic nodules in the buttock and sacrospinalis muscles, and abdominal and rectal examinations are necessary in the search for clues and in the process of exclusion.

This is elementary; but gross tuberculous lesions in the lumbo-sacral and sacro-iliac areas can exist and sciatica be the only symptom worthy of note.

Two stenographers have come under my care. One had been treated for six months for sciatica, and that was the diagnosis of her condition when I saw her. She had typical sciatic neuritis with loss of the ankle jerk. Routine examination disclosed only a little prominence of the fourth and fifth lumbar spines, with some deep tenderness to lateral pressure. An X-ray examination revealed the loss of half the fourth and fifth lumbar bodies with a presacral abscess. The other patient had some gluteal pain with referred sciatic pain and a normal ankle jerk. Sacro-iliac tests revealed arthritis, but the pain was not excessive. Tests with the wet towel disclosed an area over the sacro-iliac joint on which the skin temperature was raised. An X-ray examination revealed deep tuberculous ulceration of the sacro-iliac joint, and pulmonary tuberculosis was fairly extensive.

Hydatid cysts can cause sciatica.

A man, aged forty-five years, was referred to my clinic at the Perth Hospital for physiotherapy on account of chronic sciatica and dropped foot, of several months' duration. On routine examination a tense, elastic cyst was felt in the right iliac fossa. An X-ray examination revealed ulceration in front of the sacro-iliac joint. Tests for the presence of hydatid cysts gave positive results. Granddaughter cysts were removed from the sacro-iliac joint.

These cases are mentioned to illustrate that the major pathological condition may easily be missed if one concentrates on a symptom without following a routine examination, and to show that a radiological examination is indicated in all cases of sciatica.

When the routine examination "draws a blank", and injection of the tender area in the nerve with "Novocain" and saline solution fails to give more than temporary and partial relief, lumbar puncture is indicated; the cerebro-spinal fluid should be tested for its pressure, and protein and cell contents, and the Wassermann test should be applied to it. If these tests produce no definite results, an epidural injection of "Novocain" and saline solution may give relief in funiculitis. Should, however, the epidural injection cause a considerable exaggeration of pain, a lesion within the spinal canal is suggested. Whether an epidural injection should be given before the lumbar puncture and investigation of the cerebro-spinal fluid, will depend on the conclusions arrived at from the previous history and from the course of the disease. It is certain, however, that lipiodol investigation should not be undertaken until causes outside the spinal canal have been excluded as far as possible. The risks are not great if the lipiodol has not deteriorated. Interpretation of apparent blockage to the flow of lipiodol requires experience. It is very unpleasant to search for a herniation of the *nucleus pulposus* and not find it, and then to be uncertain whether the thickened *ligamentum subflavum* or arachnoid adhesions are the whole cause of the pain. It is also unpleasant to find no blockage and to have the patient complain of pain in the feet which was not there before.

I have in mind a worker who injured his back and appeared to be suffering from sacro-iliac subluxation. I recommended manipulation; this was carried out, without relief. He then developed sciatica and his ankle jerk was diminished. I saw him again after a month and his ankle jerk was absent. He had *scoliose sciatique*. A lumbar puncture was recommended, and the protein content of the cerebro-spinal fluid was found to be 80 milligrammes *per centum*. I suggested that he have a lipiodol injection and X-ray examination. While the patient and the insurance company were demurring, his condition gradually cleared up and his ankle jerk returned. Thus I was informed.

He will probably report again with an injured back and finally be operated on for a herniation of the *nucleus pulposus*. Was the diagnosis of subluxation of the sacro-iliac joint wrong, or did the manipulation rupture a slightly bulging annulus herniation?

Congenital anomalies such as *spina bifida*, a sixth lumbar vertebra or sacralization of the transverse process of the fifth lumbar vertebra may be discovered by X-ray examination during the search for the cause, and may be contributing factors in sciatic pain. I have had no experience of these conditions as causes of sciatica, but have found them to be frequent concomitants of low back pain.

Sacro-iliac joint affections are a frequent cause of sciatic pain and are not likely to be overlooked; but since the commonest cause of sciatica, toxic fibrositis, affects the same area, and whereas painful affections of the sacro-iliac joint are frequently accompanied by painful ridges

of muscle spasm in the glutei, it may be difficult to differentiate the fibrositic nodules from these ridges.

The history, general examination and X-ray examination will make evident many of the causes of sciatica—namely, tuberculous lesions, malignant secondary deposits, Paget's disease, spondylitis, spondylolisthesis, fractures of the pelvis with excess callus in the track of the sciatic nerve, osteoarthritis of the hip, tumours and inflammation in the pelvis. A careful summing-up of the orthopædic position is necessary before and after the severe symptoms have been relieved. Malalignments of the feet relative to the sacro-iliac and lumbo-sacral joints must act as a predisposing or aggravating cause of sciatica.

Scoliosis, homolateral, contralateral or alternating, is frequently observed in sciatica. Homolateral scoliosis results from an attempt to shorten the distance between the origin and distribution of the nerve and relieve tension on the painful nerve. Contralateral scoliosis is a reflex effort to open up the joints on the affected side of the lumbar part of the spine, and any attempt to correct the scoliosis causes a spasm of pain down the affected side. This condition is frequently seen in sciatica due to spinal arthritis. Alternating scoliosis, according to Putti, results when the accessory lumbar joints are involved and the scoliosis changes to prevent too much irritation of one side. Homolateral and contralateral scoliosis are a result of sciatica and are of value as an indicator of the level at which the nerve is affected.

Treatment.

In acute cases the pain is agonizing, and I see no reason for not giving a few injections of "Omnopon". Later, or at the same time, an analgesic mixture can be given, and 10 grains of "Medinal" as a substitute for "Omnopon" can be prescribed to help sleep. Local application of a 40% solution of ichthyol in glycerin with "plastine" gives relief, and recumbency in acute cases is a forced necessity and is desirable in all cases until the pain is minimal. Patients usually prefer to rest on the unaffected side, and when pain is severe they are restless. The limb is placed in the position which relaxes the nerve and is supported on a thick pillow beneath the knee. The pillow is kept in place by sandbags and the foot is allowed to rest on a cushioned loop suspended from a cradle. Vitamin *B* should be given in adequate doses from the beginning of treatment, and sufficient attention should be paid to improvement of the patient's general health.

When a toxic focus is evident, this is treated as soon as possible—for example, dead or abscessed teeth and septic tonsils are removed *secundum artem* and intestinal or urinary infections are treated. It has been my experience in several acute cases caused by focal sepsis that when the foci are treated there is very little need for physiotherapy. It is also noticeable that when a patient with a tuberculous lesion in the sacro-iliac or lumbo-sacral areas is put in a plaster cast the sciatic pain disappears.

A plaster of Paris support for the whole limb and pelvis, extending to the nipples and kept in place for six weeks, has had much success in obstinate cases, and is I think the surest method of allowing complete rest to the nerve. In many cases its disadvantages are outweighed by the results. Extension is obtained by weight (eight or ten pounds) and pulleys applied through calico strips incorporated in Unna's paste or through leather anklets, so that freedom of movement for nursing may be had by detachment of the weight.

After the acute symptoms have passed, postural treatment, the application of heat by the infra-red lamp, radiator or other means, muscle reeducation and gradual stretching are necessary before and while the patient is allowed up.

In subacute, chronic and recurrent cases, and when tender areas are present at the sciatic notch or in the mid-femoral region with loss of the ankle jerk, massive injections into the tender areas of saline solution preceded by "Novocain" give great and sometimes lasting relief. They may have to be repeated three or four times. Some patients have a nasty rigor with hyperpyrexia within twenty-four hours after saline injections; this does not recur. As has been stated before, when the relief from this measure is only temporary and partial, epidural injection of "Novocain" and saline solution is valuable in cases of funiculitis. If the pain is exaggerated and is not relieved, a mechanical block in the cerebro-spinal fluid can be strongly suspected.

When the sciatica is due to fibrositis and when toxic causes and gout have been eliminated, deep kneading of the nodules is valuable; but more valuable still, in my experience, has been the injection of the nodules with "B.A.B.A.N."

When a tight *fascia lata* and lumbo-sacral fascia are present and when conservative measures have failed, many excellent results are obtained by fasciotomy according to the method of Ober and stripping of the posterior muscle attachments from the ilium, posterior superior iliac spine and sacrum.

Manipulation is extremely valuable in suitable cases if carried out at the right time and by the right person; otherwise, I think you will agree, it can be extremely harmful. I strongly dislike recommending manipulation unless I know who is going to carry it out. Graduated stretching is a useful and a safer substitute. There are cases in which it is necessary to expose the sciatic nerve at the notch and free it from dense adhesions. I have had occasion to do this several times, and have wondered how much force would be necessary to rupture these adhesions by manipulation. Opportunity was taken to inject the nerve with saline solution till it ballooned. These cases were the result of juxtaneural sepsis.

Gout is commoner than we suspect as a cause of persistent sciatica with exacerbations, and blood uric acid estimation is often advisable. Salicylates and iodides have proved useful. Restoration of muscle balance and tone is very necessary.

Diathermy and inductothermy are of value in chronic cases of sciatica; but in acute cases when congestion is already present, increase of pain may be considerable. There has been a tendency to apply this treatment in all cases, and in many cases the application of the treatment has not been efficiently carried out for fear of burns. The same applies to ionization. Infra-red radiation is useful when fibrosis is present. Massage is of value in maintaining the tone of the muscles and in breaking up fibrositic nodules. It is necessary that the masseur should be given instructions regarding the aims of the treatment ordered.

It is important that the patient's economic welfare should receive consideration from the beginning of investigation and treatment.

FRACTURES OF THE RADIUS AND ULNA.[1]

By H. A. SWEETAPPLE,
Sydney.

BEFORE I discuss the detail of reduction and splinting, it is a good scheme to make a list of the ideals we strive for when we are entrusted with the treatment of fractures of the radius and ulna. (*a*) There must be firm bony union. (*b*) The fragments must be in correct alignment. (*c*) There must be no shortening of one of the bones. (*d*) There must be no rotational displacement. (*e*) The full normal range of shoulder, elbow, wrist and finger movements, and of pronation and supination, must be preserved.

Firm Bony Union.

Firm bony union will occur only if the fragments are immobilized efficiently, continuously and for long enough.

[1] Read at the annual meeting of the Australian Orthopædic Association, October, 1941.

Immobilization means not only the prevention of angulation, but also the prevention of rotation of one fragment on the other. The commonest mistake made in immobilization is to forget this latter requirement. Rotation must occur at the fracture site unless specific care is taken to prevent it. Splints which do not extend above the elbow may prevent angulation, but they cannot prevent rotation. With such imperfect immobilization the lower fragments of the radius and ulna, and the splints, can pronate on the upper fragments. Because the ulna is the axis of the movement of pronation and supination, it is the ulna, not the radius, which bears the brunt of this inadequate fixation, and in the circumstances I am discussing, rotational shearing strains occur at the site of the ulnar fracture. This is why non-union is common in the ulna and uncommon in the radius.

In order to prevent this rotation (or pseudo-pronation) the splints must be fixed to some part of the limb which will prevent them from rotating axially with movements of the lower fragments. The only way I know to achieve this end is to flex the elbow to about a right angle and to continue the splints proximally to about the middle of the arm.

This criticism of splints that enclose only the forearm applies to plaster of Paris as well as to other forms of splinting. You can mould a plaster to the lower half of the forearm so that it cannot rotate within the plaster, because the wrist is more or less flat; but the upper half is a nearly cylindrical mass of soft muscle bellies, which offers no resistance to the plaster cast's rotation on the muscles.

Correct Alignment.

The fragments must be in correct alignment. This does not mean end-to-end apposition of the fragments; it means that the lower fragment of the ulna must be parallel to its upper fragment, and the lower fragment of the radius must be parallel to the upper fragment of the radius. In other words, there must be no angulation of the fracture site.

Consider the effect of angulation of the ulna. It does not matter so much from the point of view either of the shaft of this bone or of the disturbance of muscle relationship. What does matter is the disturbance in the relationship between the upper and lower radio-ulnar joints. To illustrate: if one of the hinges of a motor car door is knocked askew, the door will not open except by straining the hinge. Angulation of the ulna destroys the harmonious working of the superior and inferior radio-ulnar joints, and pronation and supination will be restricted and painful. Angulation of the radius has the same effect. Moreover, if the angulation is convex medially it has two additional results: it destroys the normal outward arch of the radius and therefore reduces the mechanical advantage this gives to the *pronator teres*, and in addition it may mechanically prevent the radius from swinging around the axis of the ulnar.

The Avoidance of Shortening of One Bone.

If overlapping of the fragments is unavoidable, there must be the same amount of overlap of the radial fragments as of the ulnar fragments. Otherwise, in addition to the cosmetic blemish of a valgus or varus hand, there will be angulation of the longer bone with all the disabilities which angulation implies.

Rotational Deformity.

Rotational deformity must be avoided. If the lower fragment of the ulna is rotated on its axis, say in the direction of pronation, and it unites in this position, the movement of supination of the forearm will ever after start "behind scratch", and will never be complete.

The Need for a Full Range of Joint Movements.

My object in enumerating these five criteria of successful treatment is to point out that these desirable results must be kept in mind and aimed at from the beginning. Otherwise they are not likely to come about by chance. Next to firm union, a full range of active movements at all joints is the most important requirement. I have already mentioned some of the things that mechanically prevent full movement.

I do not think that stiffness of the radio-ulnar or wrist joints ever results from the immobilization necessary to ensure union of the fractures. But the fingers and shoulder do not enjoy this happy immunity. Stiffness of the fingers can, and all too frequently does, result from any method of splinting which immobilizes them in the extended position. Of all the catastrophes that may follow treatment of fractures of the forearm, intractable stiffness of the fingers is in my opinion easily the worst, because it is the most difficult to cure. Even non-union of the fractures is less serious. This result is the more lamentable because it is almost always the fault of the surgeon. Almost without exception it is the result of immobilizing the limb on a volar splint which extends beyond the hollow of the hand. Even in these enlightened days, one occasionally comes across the flat, wooden board which is continued distally past the wrist, past the palm, even in some cases to beyond the finger tips. It is impossible to condemn this in terms too strong. But the protagonists of plaster of Paris do not avoid this complication.

It is strange that when a new technique is learnt, the unessential though more dramatic features are absorbed and adopted with the traditional zeal of a convert, while the essential features are overlooked. It does not prevent the occurrence of stiff fingers, nor does it ensure perfect reduction and early union, to sketch the deformity on the surface of the plaster cast, and to write thereon the date of the accident. To be reasonably certain of avoiding the dreadful catastrophe of stiffness of fingers, the fingers and thumb must be unimpeded by the splints. They must be free to move through their complete range of movement at all joints, and it is the surgeon's responsibility to see that they in fact do so move, not passively but actively, from the first day. Any splint which extends beyond the necks of the metacarpals on their volar aspects impedes this movement, and it is easily overlooked that the neck of the index metacarpal is more proximal than even the first transverse skin crease in the palm. My own practice is to terminate the volar splint at the level of the wrist joint.

As to the shoulder, it is saved from stiffness if care is taken that the patient moves it through a complete range of movement at least once a day. If the arm hangs dependent at the side, the shoulder will develop some degree of stiffness which in an elderly person may prove permanent.

Methods of Reduction of the Fractures.

These, then, are our objectives, and I think that they are more important than the methods used to attain them. There are many good methods, differing in detail, but all depending for success on the same basic principles. The requirements for successful reduction of fractures are as follows:

1. X-ray films showing the whole length of both bones, in two planes at right angles.

2. A pair of aluminium gutter splints, each slightly broader than the widest part of the forearm, and as long as the distance from the olecranon process to the metacarpal heads. On one of these is marked the distance from the level of the lower end of the radius to the cubital fossa, when the elbow is flexed to a right angle. At this level the splint is bent to a right angle over the edge of a table, and it is ready for use as the volar splint. Both splints are lined with an even thickness of cotton wool.

3. Two pieces of one-inch adhesive tape to hold the splints to the forearm, and one piece of two-inch strapping to hold the short limb of the volar splint to the arm above the elbow. These are cut and kept close at hand.

4. Some means of applying prolonged traction and counter-traction, if the X-ray films do not prove that end-to-end contact of the fragments of each bone already exists. If end-to-end contact is present, it is necessary only to correct any angular deformity which may be

present, to place the forearm in supination, and to apply the splints *secundum artem*.

If end-to-end contact is not present, shortening will be noticed (as shown by overlap in the X-ray films) and a disorderly array of the four fragments. I believe that the displacement of the fragments is due to the direction of the violence which caused the fracture, in association with the sudden reflex spasm of the muscles of the forearm as they attempted to protect the limb. Once the limb is immobilized, first by the patient's instinctively hugging it to the body, and later by splinting, I do not believe that any muscle spasm continues unless the method of treatment is by continuous traction. Continuous traction evokes a continuous "stretch reflex" and therefore a continuous deforming shortening reaction of the muscles. If on the other hand the limb is immobilized, the peaceful muscles will adapt themselves by "postural tone" to the attitude in which the limb is placed, and if there is no movement there will be no pain, and therefore no reflex contraction, and no subsequent deformity attributable to muscle pull. The only deformity which can occur will be the result of gravity. There will be a tendency for a dorsal convexity to develop as the swelling subsides and the dorsal splint in consequence fails to give continuous support.

5. A depth of anæsthesia sufficient to relax the muscles.

6. And the last requirement, an assistant.

The method of reduction is as follows. The elbow is flexed to a right angle and the loop of a long bandage is passed round the arm just above the elbow; its other end is tied to a door knob, the head of the bed, or a hook in the wall. One end of another bandage is attached by a clove hitch round the patient's wrist and its other end is made fast around the assistant's waist. The assistant leans back, exerting steady and strong traction until the surgeon is satisfied, not only that the overlap has been overcome, but also that the most proximal spike of each distal fragment is drawn down clear of the most distal spike of each proximal fragment. It may take ten minutes before this occurs if the patient is an adult. It is at this stage that success or failure will be determined. Ten minutes pass very slowly in these circumstances, and no assistant can maintain a steady pull for this time if he is attempting to do it with his hands alone. That is why it is necessary for the second bandage to be tied round his waist. The lower part of the patient's forearm is placed midway between supination and pronation, because the upper fragment of the radius will naturally be in this position. The surgeon attempts to grasp the upper and lower fragments of one of the bones in the thumb and fingers of each hand. By attempting to move the ends of the fragments to and fro past each other, he is shortly able to visualize their relative position. When he thinks he can hold them in alignment, he instructs the assistant to relax the traction. The two fragments should then impinge and dovetail together. The surgeon checks this by trying to "telescope" the fragments. If he can do so, traction must be resumed and the procedure repeated.

If absence of telescoping confirms end-to-end apposition, the other bone is dealt with. This should be easier, because if the forearm is bent away from the still unreduced bone (that is, if the forearm is hinged about an axis which is the reduced fracture of the first bone), the forearm is caused to lengthen on the side of the unreduced bone. Overlap is reduced and the ends are made to engage with each other as before. This operation is aided by the assistant, who maintains traction.

When both bones have been thus reduced there is almost no tendency for them to become displaced again, and the forearm is supinated while the splints are applied and fixed with the pieces of adhesive strapping previously prepared. The ulna will naturally be straight when this is done because its subcutaneous surface rests on the straight dorsal splint. The splints are wider than the forearm, and so the encircling adhesive strapping cannot compress the fragments and crowd them into the interosseus space.

The traction is now relaxed, the limb is bandaged, a check X-ray film is taken, and a sling is applied. The dorsal splint reaches to the metacarpal heads, and two or three turns of the bandage over the palm fix the hand. The thumb is left free, and the bandage is inspected to ensure that it does not restrict the metacarpo-phalangeal joints in the slightest degree. The sling is necessary, because otherwise movements of the elbow will strain the aluminium where it is bent in the cubital fossa, and it will break here in a few days.

After-Treatment.

On his recovery from the anæsthetic (preferably when he is in the suggestible state before consciousness is complete), the necessity of practising the full active range of finger and shoulder movements is impressed upon the patient. He is told to report at once if the fingers swell or if pain appears in the forearm or hand. These are the warning signals of the onset of Volkmann's contracture. The splints are inspected and the bandage is removed and reapplied firmly at least every week. This procedure automatically ensures that the dorsal angulation, which otherwise occurs as the result of gravity once the swelling subsides, will be forestalled and prevented. To have the same margin of safety when the limb is treated in a plaster splint, it is necessary to take progress radiographs and to remove the plaster cast and apply a new one when angulation commences.

At each weekly visit the range of active shoulder and finger movement is tested. If the range is not complete at the end of the first or second week, it is obvious that the patient's will power needs some outside help, and he is sent to a masseuse for supervised active movements.

When Should the Splints be Omitted?

As in all fractures, one allows a certain minimum number of weeks for union, but one applies two other tests as a check. I think eight weeks should be the minimum; but obviously the splints should be retained if there is palpable mobility of the fragments of either bone, or if the fracture site is tender to pressure. The other check is the progress radiograph, which should be taken at about this time. This should reveal ample ensheathing callus surrounding both fractures; but the fracture lines will be plainly visible and in fact will appear as quite obvious gaps. The radiologist will report that "union is far from complete". However, one reminds oneself that this appearance will persist for another month or more, and that for practical purposes union is sufficiently firm if (i) a reasonable amount of ensheathing callus is present, (ii) the fracture sites are not tender and (iii) demonstrable mobility is absent, and tests to elicit it provoke no pain. So, after about eight weeks the splints are omitted, and no excessive use of the limb is permitted. If union is not sufficiently firm the callus will become tender, but the fragments certainly will not slip suddenly. So it is safe to observe the result of the "test of recovery" (Thomas) in a week's time. If the callus is then tender the splints are reapplied.

After the splints have been abandoned, the patient reports weekly until the full range of radio-ulnar, wrist and elbow movements is restored. There is, of course, already a full range of shoulder and finger movements. This usually takes a few weeks. If progress is slow, physical therapy in the form of graduated resistance exercises, preceded by the application of heat and a little massage, is prescribed. I have deliberately said a little massage, and I purposely omit "passive" movements. The best form of resistance exercises of which I know to restore pronation and supination is the use of a gimlet and screwdriver.

Refractures.

Recently in successive weeks I came across two patients, aged eight and twelve years, whose splints had been omitted for nine weeks and ten weeks respectively, and who had suffered refracture through the original sites. In both cases I reviewed the X-ray films taken when the splints were omitted and found well ossified ensheathing callus surrounding each fracture site. One of the patients

had fallen and had struck the forearm on the edge of a kerb. As to the other, the notes only state that she fell.

I think that neither of these cases presents valid reasons for retaining immobilization for a longer period. It would have been unreasonable to retain the splints for sixteen to eighteen weeks, when at eight weeks clinical and radiographic evidence of union was no less satisfactory than usual. The fact is, of course, that unlike measles one attack of fractures does not confer immunity if the patient subsequently falls and strikes his arm on the kerb.

Open Reduction.

A small proportion of the fractures we have been considering cannot be reduced by the method I described earlier, and some of these can be left unreduced if certain postulates are satisfied—that is, if both lower fragments are parallel with their respective upper fragments, if one bone is not shortened more than the other, if both lower fragments are displaced in the same direction (not, for instance, if both are displaced into the interosseous space) and if neither bone is angulated. In such cases a satisfactory result will be obtained, which will be a fair compromise with the risks and delay of an open reduction.

If open reduction is required, it must be carried out only if asepsis can be assured by means of the "no touch" technique, with an operating theatre staff trained in bone operations and with a proper knowledge of and respect for the muscles and nerves of the forearm. A tourniquet is unsafe if it is put on (as it must be) above the elbow.

A satisfactory position in which to place the patient is lying prone, with the arm on a side table. Separate skin incisions and separate intermuscular approaches to the two bones probably cause less damage than the dissection required if only one incision is made. Either bone may be attacked first; but if one fracture is transverse and one oblique, the transverse one should be reduced before the other. The first difficulty is to find the site of fracture when the injury is of more than two weeks' duration, because the surrounding callus is found to be much more abundant and much more solid than the X-ray appearance suggests. This has to be cleaned away from all aspects of both fragments with a periosteum elevator.

Traction and counter-traction are applied by an assistant, and each fragment is seized in a pair of lion forceps. With one of these in each hand, an attempt is made to distract the ends, at the same time strongly angulating the fragments so that their ends protrude from the wound. When the various projecting spikes of bone are clear of each other, they are made to engage in their proper relations like a jig-saw puzzle, and, still with the lion forceps, the angulation is undone and the bone is correctly aligned. If this proves difficult (it, of course, involves restoring the normal length of the limb), it may be necessary to leave this bone temporarily and clear the other of callus. Once the fragments of one bone are properly engaged, it is a fortunate fact that they show no tendency to become displaced unless the fracture is either very oblique, or severely comminuted.

If the fracture is oblique, it may be necessary to encircle it with two or three turns of catgut, which in some instances should pass through drill holes accurately placed in both fragments. Apart from this, no internal fixation of any kind is ever required; in particular metal fixation must be shunned. With reasonable care, displacement will not occur while the wounds are being sutured. The dressing pad should be of uniform thickness from the olecranon to the back of the hand. The aluminium gutter splints are applied as for a closed fracture; they should have been previously sterilized by boiling.

One final complication remains—namely, delayed union. The act of converting a closed fracture into an open one at least doubles the period required for union, and it will be unlikely that the splints can be omitted sooner than sixteen weeks after the operation.

THE TREATMENT OF GAS GANGRENE.[1]

By W. HUGH SMITH,
Sydney.

THE most common site of infection by gas gangrene is muscle. Rarely the disease may be localized in subcutaneous tissue. It is particularly virulent when affecting bone. The organisms responsible are spore-bearing anaerobes, the chief of which are *Clostridium welchii*, *Clostridium septique* and *Clostridium œdematiens*. *Clostridium welchii* is the most common infecting organism. If it occurs in association with *Streptococcus pyogenes*, a more virulent gangrenous infection results. The organisms thrive in decaying organic matter and may be found in the human gut. The incubation period is usually given as from twelve hours to two or three days. Clinical evidence of infection has been reported in as short a period as three and a half hours. The usual period before signs are present is approximately thirty-six hours. In civilian practice, when the incidence of gas gangrene occurs chiefly as a result of street accidents, prompt hospital treatment keeps the incidence of this infection at a low figure; but in war wounds, when many hours or days may elapse before the patient can receive adequate attention, the danger is infinitely greater.

Signs of Gas Gangrene.

The warning signs of the disease are those of toxæmia; the patient is ill and looks ill, the pulse is rapid and feeble, the temperature is raised (not necessarily high), the skin is yellowish, the face is pinched and the tongue is dry. Examination of the wound reveals a faint bluish discoloration of the tissues, which may bulge somewhat; a slight sero-sanguinous discharge oozes from the surface, and a characteristic musty or mousy smell is evident. X-ray examination of the part may reveal gas bubbles. Gas bubbles may escape on pressure round the wound and a tympanitic note may be elicited. These signs occur comparatively late as a rule. It should be remembered also that the infection has advanced beyond the area of gas formation. In the case of a limb, œdema may be present distal to the wound, associated with stiffness of the toes or fingers. Diagnosis is confirmed by bacteriological examination.

Prophylaxis.

As regards prophylaxis, gas-gangrene antiserum is generally used; 10,000 to 30,000 units given intramuscularly at the time of the injury is the usual dose. The usefulness of the serum in preventing gas gangrene or even in minimizing the virulence of the infection is extremely doubtful; at least it does no harm. The effect of the sulphonamide group of drugs in prophylaxis will be discussed later.

Treatment.

Treatment may be considered under the following headings: surgery, splinting, serum, sulphonamides and treatment by X rays. Opinion differs as to the use of several of these forms of treatment; but there can be no dispute regarding efficient surgical procedure. Efficient treatment of the wound largely prevents the occurrence of gas gangrene, and if the infection is present it is in most cases eradicated. Early and thorough surgical cleansing of the wound is essential, and consists of the removal of infected material, the cleaning out of blood clot, especially intermuscular hæmatoma, the cutting away of damaged skin edges and the excision of dead muscle. In compound fractures pieces of bone unattached to muscle must be removed. Only those vessels which will later cause trouble with hæmorrhage need be tied, so that the minimum amount of foreign material is left in the wound. Essential structures like blood vessels and nerves can usually be cleaned thoroughly without damage.

[1] Read at the annual meeting of the Australian Orthopædic Association, October, 1941.

In regard to muscle excision, the incisions should be made longitudinally; it should be remembered that the blood supply of a muscle enters its proximal part, and consequently removal of the upper portion of a muscle may be followed by gangrene of the distal part.

It may be necessary to open up fascial planes to remove dirt or scraps of clothing; but care is essential to prevent opening paths for infection to spread into clean areas. Some prefer the dry method of wound toilet, while some use antiseptics, such as acriflavine (1 in 1,000).

Oxidizing agents, such as hydrogen peroxide and potassium permanganate, have their advocates, the theory being that these are particularly effective against the anaerobes. If antiseptics are used, syringing of the wound is to be condemned, since infective material may be forced into clean areas.

After the wound toilet, if it appears certain that the wound is now a clean one, the skin may be closed with interrupted sutures. Deep sutures are not used. No attempt is made to approximate muscle or fascial layers, and if any tension whatever is required to bring the skin edges together, the wound should be left open. In extremely lacerated wounds suturing should not be attempted. For dressings, sterile absorbent gauze permits of the escape of subsequent discharge which, if retained, acts as a medium for growth of organisms. Counter-drainage occasionally is required for one or two days.

As regards amputation for gas gangrene, authorities differ. Kelly and Dowell,[1] in their advocacy of X-ray therapy, state that the mortality rate following amputation is greater than that following X-ray therapy. The details of cases given by them for comparison are, however, inadequate. Many cases are on record in which the gas gangrene has spread extensively proximal to the level of amputation, and yet cures were obtained by other methods. Tudor Hart[2] recommends amputation only in cases of massive gangrene and where vascular lesions interfere with the circulation of the limb. When amputation is practised, it should be carried out well above the infected area; flaps are not fashioned, the wound is left open to allow of good drainage and the part is elevated to prevent œdema. Secondary suture can be performed when the danger of the spread of infection has passed.

Splinting of all extensive wounds of the extremities is important, even in the absence of fracture. Immobilization is essential to prevent the spread of infection, which is likely to occur when muscle movement is not limited. Plaster of Paris serves this purpose best, giving efficient immobilization while not interfering with the circulation. Windows in the plaster cast are unnecessary, and may be harmful, in that œdema occurs around the wound edges exposed in the window and delays healing. The fingers or toes must be exposed so that a vigilant watch may be kept on the circulation of the limb, and when the vascularity of the part is suspect, some other form of splinting should be used until it is assured that the blood supply is adequate.

The onset of gas gangrene, as has been stated before, is heralded by toxæmia, and the plaster cast should then be bivalved, the wound widely exposed and devitalized tissue excised. The splinting is then reapplied.

The use of gas-gangrene antiserum as an effective means of treatment of this infection has been questioned by many writers. Claude Frankau, writing on this subject in "War Wounds and Air Raid Casualties", page 41, expresses the opinion that serum is of little or no value. Eliasson, Erb and Gilbert[3] state that the mortality rate without serum varies from 30% to 80%. Weinberg reported a series of 60 cases treated with serum, with a mortality rate of 6·7%. The consensus of opinion is that the serum is useful in treatment. An effective dosage is 20,000 units given intravenously combined with 20,000 units given intramuscularly, the intramuscular dose being repeated every four hours, until the toxæmia shows evidence of subsiding, then once a day until all danger is past. Newell[4] recommends the intravenous administration of 10,000 to 30,000 units of polyvalent antitoxin every six or eight hours.

The organism responsible should be isolated as soon as possible, and if it is obtainable specific antiserum should be used.

Chemotherapy.

Unanimity has not yet been reached regarding the use of the sulphonamide group of drugs in the treatment of gas gangrene. The work of Stephenson and Ross[5] and of Henderson and Gorer[6] suggests that these drugs, particularly sulphapyridine, may be of use in the prophylaxis and treatment of gas-gangrene infection. Bonnin and Fenner,[7] who carried out experiments on guinea-pigs, used sulphanilamide locally on wounds infected with the organisms. They claim that the growth of *Clostridium welchii* and *Clostridium septique* was inhibited. Campbell and Smith[8] studied the local and general effects of the sulphonamides in 51 cases of compound fracture. The drug was applied locally to the wounds, 15 to 20 grammes being used. After twenty-four hours oral administration was commenced, and doses of 15 to 20 grains were given every four hours. The subsequent dosage was varied after estimations of the blood concentration of the drug had been made. These writers state merely that the local and general use of this group of drugs appears to be of value. Further experiments with controls are necessary before any definite conclusion can be arrived at regarding chemotherapy.

Radiation Therapy.

X-ray therapy in gas gangrene was first used in 1928 by Kelly,[9] in the United States of America. In 1939 Kelly and Dowell collected 132 cases of gas gangrene in which this treatment was used, with a mortality rate of 11·3%. The dosage has since been standardized to 100*r* over the tissues involved twice a day for three days. Caldwell and Cox[10] carried out experiments on guinea-pigs to test the efficacy of X-ray treatment. The conclusion they arrived at was that in the treatment of guinea-pigs X rays had slight beneficial effect only. On the other hand, they emphasized the importance of early *débridement*. In Australia X-ray therapy does not appear to have been widely used. W. H. Godby[11] reports five patients suffering from gas gangrene treated at Perth Hospital and is impressed by the results. Harold Ham[12] speaks highly of the treatment of five patients at the Prince Henry Hospital, Sydney. In the majority of the cases reported by Godby and Ham serum and chemotherapy were used in conjunction, so that the actual amount of credit to be given to X-ray therapy is uncertain. Two patients under my own care received X-ray treatment; both recovered rapidly. However, both patients also received massive doses of gas-gangrene antiserum, and wound toilet had been performed.

Conclusion.

The conclusion one must reach in considering the treatment of gas gangrene is that early and meticulous treatment of wounds, followed by efficient immobilization, produces the best results. This applies also to prophylaxis. Gas-gangrene antiserum should be used, and it is of value in treatment. Drugs of the sulphonamide group are as yet unproved. No conclusive proof is available that benefit can be obtained from the use of X rays.

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"DRIVING UNDER THE INFLUENCE."[1]

By R. ASHBURNER,
Barrister at Law, Sydney.

THE offence commonly known as "driving under the influence" was, of course, unknown to the common law. It was created by statute, and properly to understand the present legal position it is necessary to consider the historical development of the legislation on the subject. In New South Wales this offence was first created by an amendment to the *Motor Traffic Act* passed in 1915. This inserted section 5 (2), which made this provision: "Any person who drives a motor-vehicle whilst he is under the influence of intoxicating liquor shall be guilty of an offence under this Act." The maximum penalty provided was £20, and it was also provided that a court convicting an offender should have the power to suspend his driving licence for such time as it thought fit.

That section governed the position until 1929. In the meantime there had been some agitation to the effect that the penalties provided were not sufficiently severe, so in 1929 section 526B was added to the *Crimes Act*. This provided that "any person who while driving on any highway or public place in a mechanically propelled vehicle is drunk or being under the influence of intoxicating liquor is incapable of properly controlling such vehicle" committed an offence. The maximum penalties provided were a fine of £50 or six months' imprisonment or both, and a conviction automatically entailed disqualification for holding a driver's licence for three years or such longer period as the court might order. Section 526B of the *Crimes Act* did not affect section 5 (2) of the *Motor Traffic Act*, and it was open to the police to proceed under whichever section they thought fit. A comparison of the two offences thus constituted shows that the offence created by section 526B of the *Crimes Act* was a more serious one and more difficult to prove than that under the *Motor Traffic Act*, and consequently it carried severer penalties. For a driver to lose his licence automatically it was necessary for the police to establish to the court's satisfaction, not merely that he was driving under the influence of intoxicating liquor, but that he was either drunk or so under the influence of liquor as to be incapable of properly controlling his motor car.

Evidently the legislature was of the opinion that the 1929 amendment to the *Crimes Act* did not go far enough, so in 1937 section 5 (2) of the *Motor Traffic Act* was amended to make the following provisions: "Any person who whilst he is under the influence of intoxicating liquor or of a drug (*a*) drives a motor vehicle; or (*b*) occupies the driving seat of a motor vehicle and attempts to put such motor vehicle in motion, shall be guilty of an offence." The maximum penalty provided is a fine of £100 or twelve months' imprisonment or both, and the person convicted of an offence under the section is automatically disqualified from holding a driver's licence for one year, or if he has been convicted of a similar offence previously within five years, then he is automatically disqualified for three years.

[1] Read at a meeting of the New South Wales Branch of the British Medical Association on October 30, 1941.

It will be noted first that the 1937 amendment constitutes it an offence to drive under the influence of a drug, and the act gives a meaning to the word "drug" with which I do not propose to deal. Secondly, this amendment makes it an offence to occupy the driver's seat of a motor vehicle and attempt to put such vehicle in motion. The latter provision was necessary because it had been held that under the old section it was necessary to prove that the defendant had actually driven the motor car; in other words, if the police saw a very drunk man take up his position behind the wheel and prepare to move off they had no power to prevent him, but had to wait until he had actually put the motor car in motion. The other important difference between the amended section 5 (2) and the old one is, of course, the much severer penalties provided, including that of automatic disqualification. I think I am right in saying that since 1937 prosecutions are almost invariably brought under the amended section 5 (2) and practically never under section 526B of the *Crimes Act*. In view of the severe penalties, it became important to determine exactly what was meant by the words "whilst he is under the influence of intoxicating liquor". The matter came before His Honour the late Mr. Justice Bavin in the case of Molloy *versus* McDonald in September, 1939, by way of stated case from a magistrate. The facts as found by the magistrate were: (*a*) that the defendant had driven a motor lorry for some 150 yards in Bayswater Road immediately prior to his arrest; (*b*) that he drove it perfectly and that he was able to control it perfectly; (*c*) that after he left the car he walked unsteadily and that his breath smelt of intoxicating liquor, that his eyes were slightly blood-shot and his speech thick, that he admitted that he had had six drinks between 6 p.m. and 1.45 a.m., the time of his arrest. The magistrate then stated that he found (i) that the defendant was under the influence of intoxicating liquor when he drove the motor lorry in Bayswater Road, and (ii) that he was then capable of properly driving and controlling his motor vehicle as required by the *Motor Traffic Act* and Regulations, and that the intoxicating liquor he had consumed had not influenced him to such an extent as to render him incapable of doing this. The magistrate then held that those facts were insufficient to support the charge, which he accordingly dismissed. The matter then came before His Honour Mr. Justice Bavin to decide whether the magistrate's determination was erroneous in point of law. The magistrate stated the question of law in what His Honour called a rhetorical question, namely: "Are the words of section 5 of the *Motor Traffic Act* to be interpreted to mean that a person who has consumed only one small glass of mild intoxicating liquor such as ale, and who is thus, however so slightly, under the influence of intoxicating liquor liable to the penalties provided by the Act?" His Honour held that the question whether a person is under the influence of intoxicating liquor is a pure question of fact, and that if it is once found by the magistrate that a person is under the influence of intoxicating liquor and that such person is driving a motor vehicle in a public place, then the offence is committed. He said that it was in no sense a necessary part of the offence that the defendant should be not only under the influence of intoxicating liquor but also incapable of properly driving and controlling the motor vehicle, although his capability or incapability to drive might be evidence to be considered in conjunction with other facts on the question whether he was or was not under the influence of intoxicating liquor. He therefore answered the magistrate's rhetorical question by saying that it all depended on the effect of the consumption of one small glass of ale on the driver. If such consumption placed him or had the effect of making him "what might rightly be described as under the influence of intoxicating liquor" and the magistrate so found, then the offence was committed.

It is important to notice the exact limits of this decision, for by some magistrates and police prosecutors it is frequently given an interpretation that is not justified by an analysis of the judgement. I have heard it suggested that it follows from the decision that a man who has had only

one or two drinks should be convicted. This is not so. It says that a man may be convicted even if he is quite capable of driving safely, but only if his condition is such that he "might rightly be described as" "under the influence". This use by His Honour Mr. Justice Bavin of the phrase "what might rightly be described as" is significant. It may be that medically speaking any man who has had one drink is under the influence of liquor, just as a man who has had a cup of coffee is under the influence of caffeine. But could he be "rightly described" as "under the influence"? That would depend on the effect of one drink on the particular man. For many years the courts have been acting on the assumption that a man may have consumed alcohol but not be in a state rightly described as "under the influence". Both in police courts and on appeals to Quarter Sessions the question argued has been: were the defendant's mental or physical faculties appreciably affected by the alcohol he had consumed? If so, he was in a state rightly described as "under the influence". Mr. Justice Bavin's decision has not altered this position in any way. The legal justification for such an interpretation of the phrase "under the influence of intoxicating liquor" is to be found in a case decided in the seventies: *Mair v. Railway Passengers Assurance Co. Ltd.*, 37 L.T. 356. That was an action on a policy of accident insurance which provided for a payment to be made by the company to the insured's executors in the event of his death by accident, but contained the proviso that the company would not be liable if death by accident was caused by an injury received while the policy holder was under the influence of intoxicating liquor. The insured, having had a few drinks, approached a woman of his acquaintance and made certain suggestions to her which are not reported verbatim. The lady's escort did not appreciate the remarks and knocked down the insured, who hit his head on the kerbstone and died of the resulting injuries. The company denied liability under the policy and the question for the jury was whether the insured had been "under the influence of intoxicating liquor" when he received the injuries. The trial judge failed to direct the jury as to the meaning of the phrase; but on appeal to the Common Pleas Division, Lord Coleridge, Chief Justice, and Mr. Justice Denman agreed that the jury should have been directed that the words meant under such influence of intoxicating liquor as to disturb the quiet and equable exercise of the intellectual faculties of the man who has taken the liquor, or under such influence as "disturbs the balance of a man's mind". If allowance is made for the fact that in that case no question arose as to the exercise of faculties other than the intellectual, the decision justifies the test that has so long been applied in practice: were the defendant's mental or physical faculties appreciably affected?

It is interesting to note that the law in England is not so stringent as it is in New South Wales. By the *Criminal Justice Act 192.* the offence created was driving while drunk, it being necessary for the prosecution to establish drunkenness. It was found that the provisions did not sufficiently protect the public, so the *Road Traffic Act 1930* made it an offence to drive or attempt to drive when under the influence of drink or a drug "to such an extent as to be incapable of having proper control of the vehicle". This would seem to provide adequate protection to the public and to be fairer than the New South Wales provision. But it should be remembered that hard cases such as that of the defendant McDonald described above can to some extent be met by the provisions of section 556A of the *Crimes Act*. Under that section a court may find the offence proved; but if it is of opinion that having regard to the character, antecedents, age, health or mental condition of the person charged, or to the trivial nature of the offence, or to the extenuating circumstances in which the offence was committed, it is inexpedient to inflict any punishment on the person, it may dismiss the charge without proceeding to a conviction. Both magistrates and judges on appeal to Quarter Sessions have the power to apply section 556A to any case of "driving under the influence", although in practice they are reluctant to exercise that power, because the legislature in making disqualification automatic has indicated that it does not think that the courts should have a discretion to suspend or not to suspend a driver's licence when the offence has been committed. The result is that the courts apply section 556A only in exceptional cases.

"DRIVING UNDER THE INFLUENCE."[1]

By R. LUCAS,
Acting Sergeant, New South Wales Police Force, Sydney.

IN endeavouring to decide why the British Medical Association extended an invitation to a member of the police force to read a paper at this meeting, I have accepted the happy belief that you desire an expression of police opinion in relation to "driving under the influence", so that comparisons may be made and, eventually, men of medicine and policemen may cooperate to combat more effectively this ever-increasing menace.

Before proceeding to my subject, I ask but one thing. When considering the attitude of the police to this question, keep uppermost in your minds that individually we derive no benefit from the course we pursue. If we rid our roads of danger, then there is only gratitude from the people to the police force as a body; if we take pride in our work, it is only that we are proud to know that people feel safer because of us. We believe that justice means justice for all, and above all it means fairness for those entitled to protection from wrongdoers. We harbour no false or stupid sympathies for wrongdoers, and we recognize that false sympathy for these offenders of whom we talk is almost as dangerous as the offence itself, and certainly as difficult to combat.

It would not be possible to proceed far with this subject without first having surmounted that obstacle, the definition of "under the influence". Because I believe it to be of such proportion as to make miniature any other obstacle which may appear to exist, I propose to direct my remarks almost wholly to this feature, and in doing so I hope that I do not trespass too seriously upon the territorial rights enjoyed by my learned friend, Mr. Ashburner.

There is no statutory definition of "under the influence" in our law, the legislature very wisely leaving it to the courts to decide. To have it otherwise would tend to place the decision in the hands of expert witnesses and remove it from those of the court. The fact of the matter is that our law considers and implies that being "under the influence" is within the experience and comprehension of every man, that it is an ordinary objective incident of existence, just like a wet day or a badly cooked meal, and that as such it deems "under the influence" not as being incapable of definition, but as not requiring definition.

Having in mind that the law assumes that all normal people will have a conception of "under the influence", we must accept that a court will have such a knowledge and comprehension. If it is possible to put into words the conception of "under the influence" which exists in the minds of ordinary individuals and therefore, in the mind of the court, I suggest it would be this: "A condition due to the consumption of alcohol which is evidenced by a demeanour interfering, or likely to interfere, with the comfort, convenience or safety of the public." What the court requires from the witness in these matters is as exact a picture as possible of the accused person's condition—not a definition, but a description of the signs which caused him to decide that the person was "under the influence". Police accept that a person is "under the influence" when he has consumed liquor and is affected by such consumption, and recognize that, if he is affected, this will become visible by a reaction to environment which is not a normal reaction.

[1] Read at a meeting of the New South Wales Branch of the British Medical Association on October 30, 1941.

It is considered indisputable that any alteration in an individual's reaction to environment must be for the better or for the worse, and it is frequently suggested that the ingestion of alcohol may, in its first effect, remove inhibitions and cause a person to react more normally to life—he would become more assured. When this occurs, it is also suggested that the effect has been for the better. It may be for the better in relation to his social activities; but who could believe that a person with a false courage engendered by the consumption of alcohol would become a safer motor vehicle driver?

I believe it was Halporn who said that when Noah embarked on his record-making endurance trip, a little yeast cell went along for a ride. Having no mate to comfort him, he fell in with the grapes. Noting the commotion in the grape cask, Father Noah made oft-repeated investigations, whereupon, as far as he was concerned, the ark never ran better and the stalls never smelled sweeter.

It is with two points in our minds that the police approach the question of whether or not a person is "under the influence": we must smell liquor, and there must be some visible indication that the liquor has affected the person. In this we are extending considerable latitude towards this type of offender, for it is recognized that there are three stages of alcoholic intoxication. The first stage is that in which the person converses well, but self-restraint is slightly relaxed; there is a feeling of well-being, and critical judgement is lost, but the will-power is not itself affected, the drinker being able to reassert his self-control by voluntary effort should the occasion demand it—and the advent of a policeman is the occasion which does demand it. At this stage he is safe in so far as the police are concerned. It is in the second stage that his speech becomes slurred and incoordination noticeable. Here he must control his movements by a definite, conscious effort of will, and it is when he arrives at this stage that he falls into the hands of the police. The third stage is that in which he responds only to stimuli or falls into deep sleep.

As police, we require the drinker to be in the second stage of alcoholic intoxication, because we must be in a position to describe signs which will satisfy a court that our judgement was a correct judgement. We fully appreciate that there does exist a very real danger from drinkers who are only in the first stage, and believe it should be the task of the medical profession to diagnose these for us.

You will have noticed that I refrained from coupling "under the influence" with driving. It is here that I believe we strike the secret of a correct interpretation of the law of this State. It is the law of England that there must be some incapacity properly to control a vehicle. Section 15 of the *Road Traffic Act* of 1930 reads as follows: "Any person who, when driving or attempting to drive, or when in charge of, a motor vehicle on a road or other public place, is under the influence of drink or a drug to such an extent as to be incapable of having proper control of the vehicle, shall be liable." Those words "such an extent as to be incapable of having proper control" demand that, in so far as this law is concerned, lack of proper control must be proved before an offence can be established. If called upon to conduct a medical examination of an alleged offender against the English law, you would be duty-bound to decide whether or not the person was capable of exercising proper control of a motor vehicle.

In this State you have a law which is vastly different; Section 5 (2) (a) of the *Motor Traffic Act* reads: "Any person who, whilst he is under the influence of intoxicating liquor or of a drug, drives a motor vehicle, shall be guilty of an offence under this Act." There is no demand here that incapacity properly to control the motor vehicle shall be established. Those words which are embodied in the English section were deliberately left out by our legislators, because they would defeat the very purpose of this particular section of the *Motor Traffic Act*. In this State a person who has consumed intoxicating liquor to such purpose that he becomes incapable of properly controlling a motor vehicle which he drives becomes the subject of a charge under our *Crimes Act*, and it is here that we must prove incapacity to control the vehicle. Our legislators recognized the danger from drivers who, whilst having consumed intoxicants, were not drunk or so far "under the influence" as to lose control of the vehicle, and to eliminate them from our roads, they framed section 5 of the *Motor Traffic Act* in its present form, providing heavy penalties for offences against this section.

If, as medical men, you are called upon in this State to diagnose the condition of a person suspected of driving a motor car whilst under the influence of intoxicating liquor, you must only decide whether that person is "under the influence". You have not one tittle of right to consider whether the person's suspect condition would disturb his skill as a motor driver; in fact it is advisable that you dispel from your minds all thought of motor cars and refrain from examining him as a motorist. The only right you have, and it is a duty equally as much as a right, is to examine a human being to ascertain if such human being is affected by alcohol which he has consumed. If our contention in regard to the interpretation of this offence is a correct contention, then we can neglect to examine the various definitions which have been arrived at in other countries—and further, you must disregard the results of tests conducted by medical men of England and the United States of America to decide when a person is "under the influence", for the laws of these countries require a higher degree of intoxication than does our law. They require the person to be in the second stage of alcoholic intoxication, whilst here the first stage brings him within the ambit of the section.

Having suggested that you will disregard the results of tests conducted in other countries, I do not propose to discuss them further, and I feel sure that you will readily agree that they must be disregarded if you can be satisfied that our interpretation of the law is a correct one.

Let me read to you words which were used by His Honour the late Mr. Justice Bavin in the Supreme Court of New South Wales on September 19, 1939, when the learned judge decided a point of law which arose in the matter of Molloy against McDonald. His Honour said: "It all depends on the effect of the consumption of even one small glass of ale on the driver. If such consumption places him, or has the effect of making him what might be rightly described as, under the influence of intoxicating liquor, and if the Magistrate so finds, then the offence is committed." Further: "The legislature has not made incapacity for properly driving the test."

While he was deciding this matter, I have no doubt that the fact that this particular offence is one which frequently results in loss of life or injury by accident operated very strongly on the mind of this learned judge, for it is a primary rule of interpretation of statutes that when any statute is directed towards guarding against accidents with resultant loss of life or injury, then the court shall, as far as possible, endeavour to carry out the object of the legislature as far as the language of the act will reasonably permit. The language of the statute which creates the offence of driving under the influence of intoxicating liquor will permit a very strict interpretation of those words "under the influence", and because of this, Mr. Justice Bavin in his wisdom saw fit to suggest that even one small glass of ale might place a driver within that category. That decision of Molloy against McDonald simply expelled any doubt which may have existed as to the interpretation of the section. It affirmed the interpretation which had been accepted by the police; at the same time it clearly distinguished our law from the law of England.

It has been the practice of medical men to favour an interpretation which required a marked degree of being "under the influence". In this they required something which the law did not require; they went directly away from the intention of the legislature, and in doing so have greatly hindered us in our efforts to bring safety to the roads. I believe that the medical profession and the police force have been at cross purposes in this matter,

each seeking a different condition, and I do suggest that you will, on examining our reasoning and the law which supports this reasoning, appreciate the need for revision of your methods of conducting examinations. To discuss the merits and demerits of medical examination of persons who are "under the influence" is beyond my aim and capacity, so I only ask that you will, when conducting such examinations, do no more than search for an effect produced by the consumption of alcohol.

Whilst we recognize the invaluable assistance rendered by the medical profession in relation to crimes of violence, I tell you frankly it is the opinion of the policeman in the street that, in this, you are not for us but "agin us". We have unequalled opportunities of gauging public opinion, and we know that it is the opinion of motorists who commit this offence that they call, not a doctor to conduct a medical examination, but the family physician or friend to get them out of the trouble into which liquor has led them. Here are two bodies which, united, could literally wipe out one of the most dreadful of all our many social evils, and these bodies, each having a duty to society, have never united to effect what should be a common purpose, for while it is our duty to enforce the law, it is equally a duty of yours to aid us in this direction if, by aiding us, you can effect your own purpose of conserving the health of the people.

On behalf of all members of the service to which I belong, I desire to thank the British Medical Association for this opportunity of expressing our opinions. If you believe my choice of words unhappy or unwise, remember that I have, in reality, taking an opportunity to plead the cause of tomorrow's victims of partly drunken drivers, and let me assure you that we would welcome closer cooperation with you in dealing with this problem, or perhaps I should say tragedy, of our social system.

"DRIVING UNDER THE INFLUENCE."[1]

By JOHN MCGEORGE, M.B., Ch.M., D.P.M.,
Honorary Physician, Psychiatry Clinic, Royal Prince Alfred Hospital, Sydney.

THE object of this paper is, primarily, to deal with the purely medical aspects of the subject, to describe the clinical signs of drunkenness, to discuss the differential diagnosis and to mention some biochemical tests which may be regarded as the only really conclusive evidence of intoxication. If we were to take the phrase "under the influence" in its strictly literal sense, our scope would be limited, as it may be accepted that one drink of alcohol has some effect, no matter how small, on the person who takes it, and therefore would be sufficient to bring him into conflict with the law. Of course, it was never intended that this interpretation should be placed on the phrase; but it is conceivable that an ardent police prosecutor and an equally complacent magistrate might insist on the acceptance of such a definition, and a large harvest would then be reaped from every social function; even the Criminal Investigation Bureau dinner might not be immune from suspicion. Such a meaning would simplify matters considerably, so that even a mere doctor would be able to determine beyond all reasonable doubt merely by the odour of a person's breath that he was "under the influence", and would not need to seek any further evidence in support of his conclusion.

It appears, however, that the matter is not quite so simple as all that. We must go further when we use the phrase, and seek a condition of intoxication which has reached such a degree as to impair judgement, coordination and control. The law has been amended so that, in many instances, the question of capacity to drive a vehicle does not arise. This makes the doctor's position more difficult. He has no standard of conduct by which to measure. If he is summoned to a police station and asked whether a certain person is "under the influence", he must answer "yes" if that person has an unduly bright eye, smells of alcohol and is mildly euphoric, although he may be capable of performing quite complicated acts successfully, may be able to drive a motor car safely and is in no sense a danger to the public. The examining doctor is not expected to determine what he can or cannot do. This puts a very powerful weapon into the hands of the police. If it is used as our legislators no doubt intended it should be, it will decrease road accidents and eventually eliminate completely the drunken driver. If it is used merely as another means of worrying an over-harassed motoring public, then it is in danger of becoming a pernicious measure. The manner in which it is employed must inevitably depend on the discretion of our police force. It may be regarded as a sad commentary on conditions in this State that nowhere else has it been found necessary, or at least considered to be desirable, for such a law to be enacted. It is all very well to talk airily of the definition of the words "under the influence". Every person one questions, whether doctor, barrister, magistrate or layman, gives a different definition; but almost all agree that ability to drive a motor car is an ingredient of it and must be taken into consideration when a conclusion is to be arrived at. If this was right there would have been no need to amend the *Motor Traffic Act* to read: "Any person who, whilst he is under the influence of intoxicating liquor or of a drug (*a*) drives a motor vehicle or (*b*) occupies the driving seat of a motor vehicle and attempts to put such motor vehicle in motion, shall be guilty of an offence."

To the average person it must appear that this amendment simplifies matters for the police at the expense of the liberty of the citizens, and as doctors we must be intimately concerned with this if we are going to be called upon to express an opinion on the state of the accused person at the time of the alleged offence. In this we have a grave responsibility, not only to the man himself, but also to those members of the public whose lives he may endanger in a condition of alcoholic exaltation and over-confidence. It would be advisable, therefore, before proceeding to a consideration of the purely medical aspect of this problem, to pause for a moment and study the menace that does exist when a motor car is driven by a drunken motorist.

Purves-Stewart[(1)] found that, in 3,297 cases of fatal road accidents attributed to motor drivers, 1·1% of the drivers were under the influence of drink or drugs. In the United States of America, where the alcohol content of the blood or urine, or both, is often determined, higher figures are given. Thus, in a series of 119 consecutive accidents, no fewer than 62% of the drivers exhibited a measurable alcohol content. Convictions for driving "under the influence" in Great Britain rose from 1,595 in 1933 to 2,018 in 1934. Purves-Stewart therefore concluded that statistics indicated that many people driving motor cars were more or less under the influence of alcohol. R. L. Holcomb[(2)] found that as the blood alcohol content increased, the number of drivers appearing in the personal injury accident group increased out of all proportion to that in the general population. As the amount of alcohol consumed increased, accidents also increased and at a rate somewhat proportionate to the increase in the alcohol consumption. He believes that alcohol is a major cause of motor car accidents.

There is little need to dilate further on the danger of the drunken driver. It is obvious that alcohol only too often leads in its early stages to irresponsibility, foolish elation and a desire for speed, in a later stage to faulty coordination and incapacity to act in an emergency, and finally to a stupid, useless state with complete loss of control over the actions and speech. In any of these stages a driver may be a danger to the public safety.

The Signs of Intoxication.

The clinical signs of intoxication, taken together, give a characteristic picture, although the individual manifestations may be of little significance by themselves. The

[1] Read at a meeting of the New South Wales Branch of the British Medical Association on October 30, 1941.

report of the committee appointed by the Council of the British Medical Association in 1925 to study the tests for drunkenness gives warning of the necessity for excluding "pathological conditions which cause symptoms similar to those of alcoholic intoxication, irrespective of the amount of alcohol consumed". Apart from an estimation of the amount of alcohol in the blood or urine, to which reference will be made later, there is no single test which is conclusive.

The principal signs are as follows:

Odour of the Breath.—If we put a broad interpretation on the term "influence", breath odour may have comparatively little significance. One drink would be sufficient to produce a noticeable odour; but the person may be to all intents and purposes quite sober. Furthermore, a patient may collapse from organic disease and be given a drink of brandy by some well-intentioned friend and thus be caused to manifest many of the signs of extreme intoxication. It can be accepted only as one link in the chain of evidence.

Vomiting.—Vomited matter, if possible, should be tested for alcohol. It must be remembered, however, that vomiting is a frequent accompaniment of concussion, which itself may result from the accident which served to draw attention to the driver in the first place. Also, cerebral tumour may cause symptoms similar to those of drunkenness and produce vomiting.

A Dry, Furred Tongue or Excessive Salivation.—A dry, furred tongue or excessive salivation is by no means conclusive and may be disregarded, as there are obviously many other possible causes of such a condition.

Congestion of the Conjunctivæ and the Reaction of the Pupils.—The pupils may be either widely dilated, strongly contracted or unequal. The possibility of such a wide variation in the appearance of the pupils renders this evidence of little value. Similar alterations may occur in various organic conditions, including concussion.

Confusion of Memory.—Confusion of memory, particularly for recent events, by itself is of little importance from the point of view of diagnosis.

Hesitancy and Thickness of Speech.—Hesitancy and thickness of speech may be of considerable significance in the absence of signs of physical disease.

Tremor and Incoordination of the Limbs.—The value of tremor and incoordination of the limbs must be assessed in conjunction with other evidence of intoxication.

Disorders of Behaviour.—Disorders of behaviour may be of great consequence in assisting the examining doctor to arrive at a satisfactory opinion as to the degree of inebriation that exists. They vary according to the stage which has been reached. After a few drinks the subject becomes more assured, possibly somewhat argumentative or even aggressive, the world appears in brighter hues, he exhibits an all-embracing friendliness (often in a literal sense) and may be unduly loquacious. As intoxication deepens so does conduct become more irregular and irresponsible, although the actual type of reaction will be largely dictated by the underlying temperament, which may prove extremely revealing to the victim's friends. He may become quarrelsome, maudlin or hilarious. It must be remembered, however, that fine shades of control may be lost without apparent signs of alcoholic intoxication. Finally, his control may be completely lost and all moral sense disappear. During this phase he is likely to commit any form of offence which could result in arrest and the preferment of a serious charge against him. Judgement is impaired at an early stage, with deficiency of concentration, attention and self-criticism, and, most important of all from the viewpoint of this paper, of the power of estimating risk. This last is the most serious, because intoxication may not be obvious, but recklessness, and the consequent danger to the safety of others, may be at its greatest.

Discussion.

It will be appreciated that none of these signs by itself would justify a doctor in coming to the conclusion that a person was intoxicated. A correct diagnosis can be reached only as the result of the consideration of a combination of several observations, which would include the general demeanour, the state of the clothing, the manner of walking, sitting down and rising, the ability to pick up small objects from the floor and the presence of hiccup.

Before deciding that a person is "under the influence", it is necessary to exclude other possible causes of the symptoms that have manifested themselves. The most common, and often the most difficult to differentiate, will be concussion, of which mention has already been made. This is particularly the case, because it is so frequently associated with the accident that has caused the driver's state of sobriety to be questioned. Pallor, unsteadiness of gait, incoherence in speech, vomiting and changes in the pupils may all be present, and it requires only the odour from one glass of lager to convince any police officer that the motorist is drunk. Fatigue is another factor which may play a large part in simulating intoxication. For example, a motorist may drive a considerable distance in one day, there may be many curves on the road and the trip may be a particularly monotonous one. He "pulls up" to have a meal and takes one drink. He then continues his drive, his attention relaxes for a moment and there is an accident. When he gets out of his motor car he sways, he is rather tremulous, his conjunctivæ are congested and his breath smells of liquor. He presents a picture which would convict him in any court; yet the only influence he is under is that of fatigue. A similar condition may be seen in a moderate degree of carbon monoxide poisoning, which induces unsteadiness, pallor, tremors, giddiness, nausea and vomiting. This occurs when the saturation of the blood is between 30% and 50%. Such a state is likely to arise when a motor car is driven some distance with a leaky exhaust pipe or some other defect in the mechanism that permits the escape of the products of combustion into the body of the vehicle. In the absence of proper tests, it may be difficult to prove that this is the cause of the motorist's disability. Certain organic diseases of the nervous system cause symptoms closely approximating those of intoxication. The ataxias, encephalitis, vascular lesions of the brain and ocular palsies with vertigo are only a few that may obscure the issue and make diagnosis more difficult. In many of these, of course, the driver would have no right to be in charge of a motor car; his physical infirmity should have excluded him and he could be proceeded against under another section of the act. Even the diabetic is not immune from suspicion. Let him take an overdose of insulin, and the resultant hypoglycæmic reaction may be sufficient to bring him to the notice of a policeman. If the latter's sense of propriety is further outraged by the presence of an aroma of alcohol, the result is practically a foregone conclusion. There are many other conditions which could be mentioned, but one will suffice. This is hyperthyreoidism, with its tremors, tachycardia, sweating and emotional excitability. In all these cases it is essential that the odour of alcohol should also be present, for even the most enthusiastic police officer would hardly be likely to prefer a charge of drunkenness in its absence.

One motorist, who rushed to the nearest police station to report an accident in which he was involved, in his excitement tripped on the doorstep and entered, somewhat ungracefully, on his hands and knees. He looked up from the floor to find himself regarded by the jaundiced eye of the station sergeant. A natural incoherence, the result of shock and emotion, with accompanying tremors, further aroused the suspicions of the officer, who approached him closely to obtain the particulars, sniffing loudly the while as if he were a sufferer from chronic catarrh. He was eventually allowed to go, with considerable reluctance on the part of the sergeant, whose face expressed an infinite regret for an opportunity lost.

Had that driver had one drink he would not have escaped so lightly.

When one considers the number of possible physical causes for the symptoms previously listed, one finds all

the more injudicious and ill-considered the attitude of the magistrate who remarked that he preferred in cases like these to accept the evidence of a policeman of twenty years' experience to that of a medical man. Only a doctor is competent to distinguish between an organic disease and intoxication. Admittedly, the necessity for such a distinction does not often arise; but one must never forget that there is no single symptom due to the consumption of alcohol which may not also be a sign of some other pathological condition. If the defendant is a patient of the doctor, matters are simplified, as the doctor's own knowledge of him will be sufficient to exclude most conditions and he has only to decide whether concussion plays a part. In the absence of signs of head injury he is not entitled to diagnose this condition simply because of his personal knowledge of a person's habits. A general practitioner meets his patients on a much more intimate footing than a consultant; he is the family friend in many instances as well as the family physician, and he must scrupulously avoid any tendency to sympathy with the person he is examining. It may be very difficult to adopt an attitude of strict impartiality in such circumstances; the personal element must creep in. Perhaps the best solution of the problem would be to have a divisional police surgeon to examine all suspects, if required, in the presence of the man's own doctor. Another suggestion is that the court should have in all these cases the benefit of the advice of a medical man who would listen to the evidence and express an opinion with regard to the condition of the defendant at the relevant time. This would entail a sifting of the various statements that requires a legally trained mind, a qualification few doctors possess. The evidence of a consultant, who usually does not appear in the case until it reaches appeal, is more impartial. He does not know the motorist and he should always give his considered opinion only on hearing all the evidence. He will no doubt have presented to him the most favourable aspect by the defending solicitor, and he must therefore beware of coming to a decision before the police case has also been stated. If he takes this precaution he will not be labelled a "professional" rather than an "expert" witness.

There are certain aspects which may cloud the issue. On the one hand a relatively small amount of alcohol may produce a pronounced effect if taken on an empty stomach or at a time of great emotional stress or shock or by a person who is not accustomed to it. On the other hand, shock may have a sobering effect, the fact of arrest may serve as a stimulus to make him pull himself together. The effect of alcohol varies with the rate of absorption, which is normally 10 to 12 cubic centimetres per hour; but it may be much retarded by the presence of fats in the stomach, and a person who habitually drinks may take large quantities without any obvious impairment of his faculties. All this may serve to present a different picture to the doctor when he arrives than that seen by the police at the time of the alleged offence. This is a frequent cause of the conflict in the evidence given in court. It may be necessary also to take into consideration the degree to which a person is used to perform a certain act, such as driving a motor car. If he commonly drives for several hours per day, he is better able to do so "under the influence" than one who is rarely at the wheel. One thing which has been overlooked is that the man with a "hangover" may be a greater danger to the other users of the road than one who is mildly "under the influence". He may well be suffering from post-alcoholic effects, which make him tremulous, faulty in his judgement, nauseated, unsteady and incapable of properly controlling a motor car; yet there will be no smell of alcohol to prove that he is still affected by drinks previously consumed.

Biochemical Tests.

The question of "influence" must essentially be one of degree; the only accurate means of determining this is by an estimation of the alcohol content of the blood. Although many clinicians are apt to belittle the value of a blood alcohol estimation, they are only too well aware of the loopholes in a purely clinical examination. The test has one great advantage, in that the blood can be taken some hours after the arrest of the subject and the amount at any given time can be calculated with reasonable accuracy, because we know that the rate of metabolism is fairly constant. From this it can be determined how much was actually ingested. Although absorption is lower in the habitual drinker and tolerance is greater, it is still possible to give an opinion as to the minimum amount of alcohol consumed. This may be of great importance.

There is no need to describe here the nature of the tests; we are mainly concerned with the results and should be able, when shown the analyst's report, to express an opinion with regard to the degree of intoxication. One hour after its ingestion the alcohol is fairly uniformly distributed throughout the body fluids. If a man weighing 150 pounds has a blood alcohol content of 0·18%, we can calculate the quantity of alcohol consumed. If we assume that the body fluids make up two-thirds of the body weight, then in this case they would weigh 100 pounds. The amount of alcohol ingested must have been 0·18 pound or about three ounces. This amount, according to the report of the committee of the British Medical Association formed in 1935 to study the relation of alcohol to road accidents, "affects adversely the power of making movements dependent on rapid and accurate coordination". This quantity also is considered to diminish attention and control, reduce the capacity to learn and affect reasoning powers.

The result of the estimation is expressed in milligrammes of alcohol per 100 cubic centimetres of blood. The relation between the blood alcohol content and the degree of intoxication is as follows. Ten to 80 milligrammes *per centum* cause no gross clinical abnormality of behaviour, but careful testing reveals delayed reaction time, diminution of judgement, attention and control, and loss of efficiency in finer performance tests. One hundred milligrammes *per centum* in 33% of cases tested caused euphoria, talkativeness and over-confidence. In this group belong the borderline cases. One hundred and thirty milligrammes to 180 milligrammes *per centum* bring about clinical signs of moderate intoxication with diminution of control, mental confusion and incoordination. These signs are present in a percentage of cases, ranging from 50% with a concentration of 130 milligrammes of alcohol *per centum* to 80% when the content reaches 180 milligrammes *per centum*. Two hundred milligrammes *per centum* cause obvious inebriation, with psychic and speech disorders and cerebello-ponto-bulbar motor symptoms. Three hundred and fifty milligrammes *per centum* bring about stupor and inability to stand or walk. Four hundred milligrammes to 500 milligrammes *per centum* cause complete coma, and the subject may be on the verge of death.

It is universally accepted that an alcohol content of more than 200 milligrammes *per centum* indicates definite intoxication. If the content is over 150 milligrammes *per centum* one can give a positive opinion if the clinical signs are also taken into consideration.

The alcohol content of the urine is usually about 35% higher than that of the blood; likewise, the cerebro-spinal fluid alcohol content is usually somewhat greater than that of the blood.

With proper precautions, these methods not only demonstrate the presence of alcoholic intoxication, but also indicate its severity. When such tests become more readily available, their medico-legal importance will be increasingly appreciated by the legal as well as by the medical profession.

It may be of interest to mention an alcohol tolerance test described by Blotner.[3] Absolute alcohol, 0·6 cubic centimetre per kilogram of body weight, was given, usually in a solution of 50 cubic centimetres of absolute alcohol, 50 cubic centimetres of grape juice and 150 cubic centimetres of water. The alcohol content of the blood and urine was determined in each case before the test meal and at intervals of half an hour for a period of four hours. The concentration was found to be slightly higher than normal in patients with *diabetes insipidus*. The same applied to

patients with *diabetes mellitus*; but the symptoms of intoxication were the same. The ingestion of food beforehand caused a decrease in the levels of alcohol in both the blood and urine. Diuresis induced by forced water drinking did not dilute the concentration in the urine, but increased by approximately 3% the total amount excreted. It appears, therefore, that there is no way by which a person may conceal his intoxication from the prying eyes of the analyst, although by an effort of will and the aid of some scented lozenges he may succeed in doing so with a suspicious police officer.

Drugs.

It will be remembered that the act deals not only with the motorist who is under the influence of intoxicating liquor, but also with the one who is affected by a drug. it must be noted that it does not specify a narcotic drug; it specifies that drug to which the *Police Offences (Amendment) Act* applies. If this is to be taken literally, it means that everything in the pharmacopœia is proscribed. A particularly vigilant constable could pounce upon a motorist whom he saw taking an aspirin and charge him—a truly Gilbertian situation. This means a drug as defined in the *Police Offences (Amendment) Act*, and this includes all the narcotics. It is extremely difficult to determine the drug that has been taken. Even the pin-point pupils produced by the opium derivatives cannot be regarded as conclusive evidence. In addition, the influence of drugs may produce confusing symptoms suggestive of intoxication. This is particularly likely to occur in overdosages of hyoscine and belladonna. However, there are many other drugs to which the same applies. This question is one which is less likely to arise than that of intoxication, and is much more difficult to answer.

Conclusion.

It appears from what has been said that the conclusions to be drawn are as follows:

1. There is no single sign pathognomonic of alcoholic intoxication. The correct diagnosis can be arrived at only if all the facts and all the clinical evidence are taken into consideration. These include odour of the breath, general appearance, demeanour, gait, speech and the performance of acts requiring good coordination.

2. The only positive evidence is obtained from a determination of the alcohol content of the blood. This is irrefutable.

3. The question of a medical witness's partiality, if it really exists, can be solved only by the appointment of a divisional police surgeon to examine the defendants.

4. The problem is further complicated by the fact that tests emphatically prove that one drink of alcohol is sufficient to bring a person under its influence. In spite of the idiosyncrasies of legislators, irrespective of their class, creed or political convictions, it cannot be assumed that they intended this interpretation to be placed on the act.

5. The hope is expressed that the police will have a better appreciation of the difficulties which confront a doctor in making his diagnosis, and that they will be less critical of his opinion, which in most instances is a genuine expression of his doubt that a person has been truly "driving under the influence".

References.

(a) J. Purves-Stewart: "Alcohol and the Motor Driver", *Edinburgh Medical Journal*, Volume XLIV, October, 1937, page 633.
(b) R. L. Holcomb: "Alcohol and Motor Accidents", *The Journal of the American Medical Association*, Volume CXI, 1938, page 1076.
(c) H. Blotner: "Alcohol Tolerance", *The New England Journal of Medicine*, Volume CCXX, 1939, page 283.

Reviews.

TRAINING FOR CHILDBIRTH.

IN 1939 the first edition of "Training for Childbirth, from the Mother's Point of View" was published; it was reviewed in this journal in the issue of October 11, 1941. That a second edition[1] has become necessary so soon after the appearance of the first is not surprising, for, as we indicated last October, Miss Minnie Randell has produced a valuable book. In the present edition some matter has been added. Importance must be attached to the new section on care of the feet, and some new exercises for use during the puerperium have been added in Chapter V. One of the most interesting sections in the first edition was that devoted to diaries of first labours. To these a "second series" has now been added. This book has an assured future; all who have the care of women in pregnancy and childbirth will wish it well.

A TEXT-BOOK OF GYNÆCOLOGY.

THE third edition of Wilfred Shaw's "Textbook of Gynæcology" is one of the best of its kind.[2] It is "intended for the use of students presenting themselves for qualifying examinations, and it may also be of service to practitioners".

Throughout the whole book the hand of the practising and practical gynæcologist is discernible, and the advice tendered, on the whole, is sound. The great majority of the illustrations are very good, but a small minority are poor. The drawings taken, with courteous acknowledgements, from the Peham Amreich "Operative Gynæcology" and the Veit Stoeckel "*Handbuch*" are superlative.

There is a very good chapter on sex hormones in which the modern ideas are well and concisely stated. We are in complete agreement with the author in insisting that hormone therapy should always be preceded by accurate diagnosis, tedious though the various processes may be. Only by this careful investigation can real progress be made.

There are, of course, some statements in this book with which we disagree. For example, the author states that Fothergill's operation is insufficient in complete procidentia. This in our opinion is quite wrong. In fact, when properly done, we consider Fothergill's operation the only one to be entertained. Also the continued use of pessaries in the treatment of retroversion is not in the best interests of the patient, and the Alexander Adams operation is not the best method of surgical interference. There are too many recurrences today from this operation, performed by the leading gynæcologists of a few years ago. The Grafenberg ring and the gold pin pessary, if mentioned in a text-book at all, should be included only amongst the list of medical curiosities of an unenlightened age. The use of Auvard's speculum in a major operation falls into a similar category.

It is pleasing to note that the "wait-and-see" method of dealing with a ruptured ectopic gestation is being so strongly attacked by modern authors. Shaw writes: "All cases of ectopic gestation must be operated on once the diagnosis has been made", and "operation . . . should always be undertaken however desperate the patient's condition may be". We thoroughly agree. An Australian gynæcologist with many years' experience in a large metropolitan hospital declares that he has yet to see a patient with a ruptured ectopic gestation die of shock or loss of blood once she has reached the operating table.

Total hysterectomy, according to the author, presents many more possible complications than the subtotal hysterectomy. Whilst this is true, no matter what technique is used, the Worrall method, as practised in Sydney, reduces these complications considerably, and we think that total hysterectomy should be performed wherever possible, unless the patient has a healthy nulliparous cervix. Also surely most gynæcological surgeons have now abandoned the practice of leaving the vaginal vault unsutured after total hysterectomy.

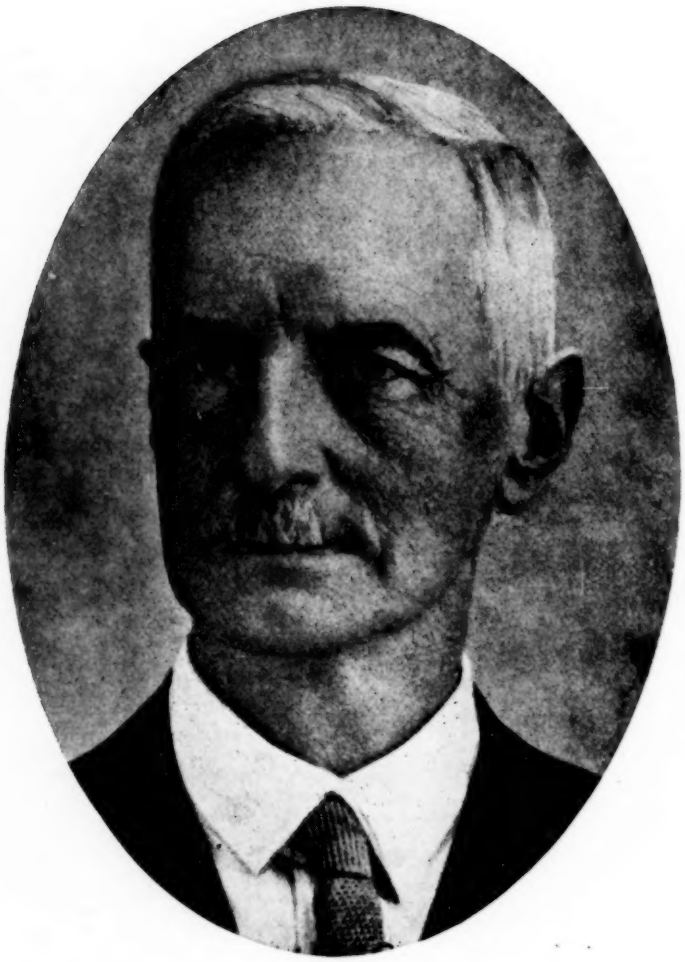
The so-called special sex tumours of the ovary are shortly dismissed, and definite statements are made in their description which are by no means proven, and some are probably inaccurate. This is an interesting subject, to which more space might have been given.

There is an excellent chapter on radium and radiotherapy, and a very useful appendix of the sex hormone preparations and their posology is added.

This is a book which all students of medicine, both graduate and undergraduate, could read with profit and interest.

[1] "Training for Childbirth, from the Mother's Point of View", by M. Randell, S.R.N., S.C.M., T.M.M.G.; Second Edition; 1941. London: J. and A. Churchill Limited; Sydney: Angus and Robertson Limited. Foolscap 4to, pp. 198, with 140 illustrations. Price (English): 10s. 6d. net.

[2] "Textbook of Gynæcology", by W. Shaw, M.A., M.D., F.R.C.S., F.R.C.O.G.; Third Edition; 1941. London: J. and A. Churchill Limited. Medium 8vo, pp. 624, with 4 colour plates and 255 illustrations. Price: 21s. net.



W Kent Hughes

The Medical Journal of Australia

SATURDAY, JANUARY 24, 1942.

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MOTOR CAR DRIVING AND ALCOHOLIC INTOXICATION.

On several occasions during the past three or four years discussions have been devoted in these columns to the subject of motor car driving and the avoidance of accidents. While there is doubtless no need to lay stress on the urgency of the problem, readers may be reminded of its magnitude by the fact that during the year 1939, 1,405 persons in the Commonwealth (1,117 men and 288 women) died from injuries received in motor car accidents. Motor car accidents may be due to many causes, and these may have to do with the car itself, the road on which it is driven, other vehicular traffic, the driver of the car and pedestrians. A treatise might be written on each of these causes. Most of them have been discussed at one time or another in this journal. In May, 1935, motor traffic accidents were the subject of a leading article. Reference was made to accident proneness and to the finding of the Industrial Research Board of the Medical Research Council of Great Britain that accident proneness in factories is subject to definite laws. Accident proneness on the roads does not differ materially from accident proneness in factories, and there will be no disagreement regarding the contention that motor car drivers who are shown to be prone to accident should be deprived permanently of their drivers' licences. In May, 1935, we pleaded for the establishment of a Motor Accident Investigation Board, whose duty it would be to investigate accidents of every kind and of every degree of severity.

The board would investigate not only the proneness of the driver to accident, but also such aspects as the construction of the motor car and the peculiarities of roads. For example, it might be found that accidents were liable to occur with some of the so-called improvements in the newer types of motor car, except when they were driven by the most experienced drivers. Again, it might be found that road gradients and/or camber of a particular type were frequently associated with accident . . . After a period legislation suitable to the findings of the board would have to be passed by the legislature.

There is at the present time just as much need as there was in 1935 (and possibly more) to study each accident. It is not to this, however, that we would now draw attention. We propose rather to deal with alcoholic intoxication and the driver, and this is after all a section of the whole accident problem.

The three papers published in this issue under the engaging and colloquial title "Driving Under the Influence" were read at a meeting of the New South Wales Branch of the British Medical Association. Mr. Ashburner, Acting-Sergeant Lucas and Dr. McGeorge have presented clearly the points of view of the law, of the Police Department and of medicine. The value of the discussion lay in the opportunity that was given for plain speaking and for the discovery of a common point of view. Antagonism between the medical profession and the police was mentioned; if such an antagonism exists, it is much to be regretted. If police officers who are continually dealing with this question gain the impression that medical practitioners are not for the police but against them, this may perhaps be understood. The matter, as Dr. McGeorge explained, is not simple. The medical practitioner has to diagnose alcoholism as distinct from other pathological conditions, and he also has to determine whether the demeanour of the patient, which is probably unusual, is in any degree due to the fact that he finds himself face to face with a charge that he has broken the law. Many practitioners know that they appear at the start to be biased in favour of the person under examination, and this of itself may make it difficult for them to appear as impartial observers. Be that as it may, we can all agree that the medical man in such circumstances has to try to determine one fact, and one fact only, and that is whether the examinee is or is not under the influence of alcohol. Acting-Sergeant Lucas defined three stages of alcoholic intoxication. He pointed out that when speech becomes slurred and incoordination noticeable, a driver falls into the hands of the police. The matter would appear to be quite simple: if a driver under suspicion is found to have slurred speech and to be incoordinated, he is "under the influence". But there are other causes of slurred speech and incoordinated action. As Mr. Ashburner pointed out, in at least nine cases out of ten the average experienced policeman is equally as capable as the average medical practitioner of passing judgement as to whether or not a man is rightly described as under the influence of alcohol. It is, however, as he insists, the tenth case that is so important in the administration of justice. Obviously in this tenth case the medical practitioner alone is qualified to pass an opinion. Medical men, in common with workers in all branches of science, know that if certain qualities or attributes are capable of measurement, it is possible to give an opinion regarding them. For this reason workers in all civilized countries have sought a criterion of alcoholic intoxication in the determination of the alcoholic content of the blood. This method of examination has been mentioned in these pages on many occasions. Readers will find an excellent discussion of it in an article by Dr. H. K. Fry, which appeared in January, 1941, in the series of special articles on psychiatry in general practice. Dr. Fry quotes the percentage figures given by Widmark for the number of milligrammes *per centum* of blood alcohol and the corresponding percentage of persons in

whom intoxication was found to exist. He also quotes Andersen, who ruled that a person was under the influence of alcohol if he had an alcohol concentration in the blood of 240 milligrammes *per centum*. The National Safety Council in America has fixed 150 milligrammes *per centum* as the amount above which intoxication must be assumed to exist. Henry Newman and Edwin Fletcher, writing in *The Journal of the American Medical Association* of November 9, 1940 (see THE MEDICAL JOURNAL OF AUSTRALIA, February 22, 1941), however, concluded from their studies that if the standard of 150 milligrammes was accepted, at least 25% of persons would be wrongly convicted of drunkenness on the basis of alcoholic concentration. It is of interest also to recall that Professor A. J. Clark has estimated that one person in a thousand will not be intoxicated by about four times the blood alcohol concentration that intoxicates about 50% of the population. Obviously the degree of tolerance to alcohol which the human body may acquire makes it impossible to use the estimation of the alcoholic content of the blood as the sole criterion of intoxication. Emphasis must therefore be laid on Dr. McGeorge's statement that the alcoholic content of the blood must be taken as proof only in conjunction with the other signs that are present. From this it follows that every possible test must be applied. Moreover, since there appears to be some difficulty about the use of tests by members of the police force, some form of enactment or regulation will have to be introduced to confer necessary powers on the police. In this connexion reference must again be made to the apparatus devised by Newman and Fletcher, and described in this journal last February. By this apparatus it is possible to test the subject's steering ability and also the speed with which he can apply brakes on the appearance of a red light. There is probably something in the contention of Newman and Fletcher that the results obtained with their apparatus are more satisfactory than estimation of the blood alcohol concentration in demonstrating the loss of efficiency in the driving of motor cars. At the same time, while the unconfirmed evidence of Newman and Fletcher for the efficacy of their apparatus will not be accepted, most medical men who have studied the subject of motor car driving and alcohol will agree that the apparatus should be investigated.

In the examination of a person suspected of being "under the influence" several facts should be borne in mind. The first is that a medical practitioner who makes an examination, even in the police cells and at the request of the police, must obtain the consent of the person who is to be examined. If he does not do so and if in the course of the examination he lays hand on the person being examined, he renders himself liable to a charge for assault. Further, in the article previously mentioned, Dr. Fry made a statement which is of importance to the person under examination. He stated that when a medical practitioner is called in by the police to examine a suspected person, the English rule that before examination the patient must always be given the right to call a doctor on his own behalf should be carefully observed. This brings us to the solution offered by Dr. McGeorge and ignored at the Sydney meeting, that a divisional police surgeon should examine a suspected person, when examination is necessary, in the presence of the man's own medical attendant. This would without doubt tend to make for impartiality and would mitigate any tendency to bias in favour of the suspect.

When a driver has been convicted of "driving under the influence" he will receive the punishment usually allotted to such offenders. His licence may be suspended for all time or merely for a period. If the licence is withheld for a period we would offer once again a suggestion made in this journal on a previous occasion. Drivers convicted of "driving under the influence" and those who are found to be responsible for road accidents and are not intoxicated, generally get into trouble on account of "speeding". When such a person, after being deprived of his licence for a period, is once more allowed to drive a motor car, he should be licensed for a vehicle whose engine is fitted with a "governor" that will not allow him to exceed a certain speed. His licence should permit him to drive no other motor vehicle. If he failed to obey this restriction his licence should be taken from him permanently. This idea of the use of a "governor" is surely worthy of consideration.

One important point remains. In his paper Dr. McGeorge laid much stress on the need for careful diagnosis in this condition and to the difficulties attendant on diagnosis. He mentioned some conditions which should preclude the sufferer from holding a motor driver's licence. It is remarkable that no one present suggested that all applicants for a licence should be medically examined before the licence was issued, so that those with at any rate some of the conditions likely to cause confusion might be eliminated. This question was discussed in this journal in the issue of April 3, 1937, in the light of an article by L. S. Selling published in *The Journal of the American Medical Association* of January 9, 1937. The suggestion would in all probability not meet with public approval, but there is no doubt about its reasonableness. The trouble about this and also about the consultation between a divisional police surgeon and another medical attendant would be the financial cost. The Police Department would probably not be allowed to spend any money on such an object, and the pity of it is that if results are to be obtained, money has to be spent.

In conclusion, the statement must again be made that the question of motor car driving and alcoholic intoxication is part of the larger question of motor car accidents due to all causes. Almost all the causes have been mentioned; of those not touched upon, the alcoholic intoxication of pedestrians is one of the most important; it will be discussed in a future issue. Now that lawyers, police officers and medical practitioners in New South Wales have shown a little interest in the subject, the interest should not be allowed to wane; the subject is one that concerns every State. Some at least of the suggestions that have been made are worth while and should be put into practice.

Current Comment.

CLUBBING OF THE FINGERS IN PULMONARY TUBERCULOSIS.

CLUBBING of the fingers is a phenomenon for which no adequate explanation has yet been given. It occurs in disease of the lungs and pleura; certain diseases of the

heart, particularly congenital disease; vasomotor defects in the peripheral circulation; chronic toxic disorders, such as sepsis and alcoholism; and neuritis resulting from pressure on the brachial plexus. In the last-mentioned disorder the force compressing the brachial plexus may be compressing the great vessels of the upper extremity also and it is almost certainly compressing vasomotor nerve fibres. In all the other disorders mentioned there is deficient aeration of the blood because of pulmonary disease or sluggish or otherwise abnormal pulmonary circulation; or there is a disturbance of the flow of blood at the periphery because of local vascular or cardiac inefficiency, the latter being due to cardiac disease *per se* or to the effects of a chronic toxæmia. The one result common to all these various factors is anoxæmia. If the blood is deficient in oxygen, whatever the reason, the fingers will be the first parts likely to be affected with oxygen lack, because they are at the periphery, because they are dependent, and because they are liable to chill. It is now more or less generally accepted that anoxæmia is the main factor in the causation of clubbing of the fingers. But the manner of this is not understood.

It is perhaps not generally appreciated how frequently minor degrees of clubbing may be seen. It is an important symptom and should never be overlooked. A slight lifting of the nail bed and an exaggeration of the longitudinal and lateral curvature of the nail should be sufficient to suggest to the observant clinician the lines the subsequent course of his investigations should follow.

An interesting and important paper on clubbing of the fingers in relation to pulmonary tuberculosis has recently been published by Rubin H. Kaplan and Leonard Munson.[1] The paper is of value, not only because of the demonstration of the little-known frequency of the association of clubbing with pulmonary tuberculosis, but also because of the summary of the knowledge of this phenomenon. Kaplan and Munson point out that since the time of Hippocrates the deformity of clubbed fingers and toes has been considered a manifestation of chronic disease of the lungs; but it is only in recent years, as a result of more careful radiological and clinical investigation of intrathoracic disease and particularly as a result of the advent of thoracic surgery, that its importance has become manifest. Certain writers, for example, have declared that clubbing of the fingers as a manifestation of or associated with hypertrophic pulmonary osteoarthropathy may constitute the initial symptom or sign of intrathoracic neoplasm.

In so-called hypertrophic pulmonary osteoarthropathy the periosteum at the ends of the long bones becomes thickened, and eventually new bone is laid down, and the bones become bulbous at their extremities. But clubbing may occur without any apparent changes in the long bones and it may consist only of swelling of the soft tissues, the periosteum being unaffected. Kaplan and Munson describe clubbing as follows:

> Clubbed fingers and toes are a bilateral, symmetrical, anteroposterior and lateral enlargement of the distal phalanges of the hands and feet. The nail, subcutaneous tissues and, in the more extreme cases, the periosteum are thickened, leading in time to the more characteristic convexity of the nail itself. Earliest findings are a bluish discoloration of the paronychium and contiguous tissue. This is followed by actual dusky cyanosis of the involved tissues. Campbell secured a finger during life which manifested marked clubbing. Sections showed the enlargement to be primarily an œdema or engorgement of the soft tissues resulting in separation of the connective tissue fibres. . . . Periosteal changes in the fingers and less commonly in the long bones may be found in more severe cases, but this generalized ossifying periostitis of the long bones is seldom associated with the clubbing initiated by pulmonary tuberculosis and its complications.

Campbell believes that clubbing commences as œdema, which is a result of decreased oxygen tension in the blood and slowing of the blood flow in the dependent parts. Persistence of the œdema results in permanent thickening of the tissues.

In an endeavour to find what is the importance of clubbing as a symptom in pulmonary tuberculosis, Kaplan and Munson examined 426 male patients who were receiving treatment in hospital. They found the symptom to be present in 72 (16·9%). The incidence was 15·7% among the 383 white patients and 27·9% among the 43 Negroes. They found no significant pulmonary complication to account for the clubbing. "Family history, general habitus, chest type, height, weight, span, finger-palm ratio, degree of cyanosis, history of hæmoptysis, character and quantity of sputum, blood count and sedimentation rate, blood pressure, telangiectasia of the skin of the face and chest and dietary history showed no peculiar tendencies and were eliminated because of similar findings in the controls." Similarly the respiratory rate, vital capacity, temperature and pulse rate were found to be about the same in patients with and without clubbing. The duration of the disease, the method of treatment, the age of onset and the age at the time of the investigation seemed to have no bearing. The type and extent of the disease were varied in both groups; but when clubbing was present the rate of progress was increased. During the period of investigation the mortality rate of the patients with clubbing was three times that of patients without clubbing. It would seem therefore that there is some additional factor in clubbing. Kaplan and Munson believe that this additional factor is disease of the right side of the heart. They found clinical abnormalities of the right side of the heart in 64 (93%) of 69 cases in which careful examination of the heart was made, as against five (8%) in a group of 61 controls. Electrocardiographic examination of 22 patients was made. Hypertensives were excluded. It was found that the axis was normal in eleven, deviated to the right in nine and deviated to the left in two. Low voltage of the *QRS* complex was noted in twenty cases. "These right heart findings probably indicate pulmonary hypertension, pulmonary arterial sclerosis, hypertrophy or dilation of the right ventricle or any combination of the four."

Kaplan and Munson point out that little has been written on the pathology of the pulmonary vessels in chronic disease of the lungs. "Undoubtedly, pulmonary disease predisposes to pulmonary vascular changes, hypertension probably being the precursor of the sclerosis and then through strain of compensation producing *cor pulmonale*", just as systemic hypertension may cause hypertrophy and dilatation of the left ventricle. They draw attention to the findings of Ackerman and Kasuga in the post-mortem examination of 333 persons who had died of pulmonary tuberculosis. *Cor pulmonale* was noted in 16%. It will be remembered that Kaplan and Munson found 16·9% of their patients to have clubbed fingers. It is unfortunate that Ackerman and Kasuga did not remark on the incidence of clubbing in their series.

Kaplan and Munson believe that the results of their investigation "prove that clubbing of the fingers is not the incidental clinically unimportant manifestation of chronic lung disease" that it is usually believed to be, but that it is of great importance in prognosis and the determination of surgical intervention. As it indicates embarrassment of the right side of the heart, operation in its presence should be undertaken only with the greatest caution.

This paper is the result of a painstaking investigation and a thoughtful study of the available material. Those who practise thoracic surgery will do well to bear in mind the possible significance of clubbing, without necessarily accepting in their entirety the views expressed by Kaplan and Munson. There is a greatly increased interest in pulmonary disease at present, and there are numerous clinics for its diagnosis and treatment in Australia. A series of investigations of hypertrophic osteoarthropathy in general and clubbing in particular, from the various States, might be undertaken. It should not present great difficulties. There is ample material.

[1] *The American Review of Tuberculosis*, October, 1941.

Abstracts from Medical Literature.

MEDICINE.

Hypertension Associated with Unilateral Renal Lesions.

LOBO ONELL AND DÍAZ MUÑOZ (*Revista Médica Latino-Americana*, July, 1941) describe three cases which suggest that arterial hypertension may sometimes be caused by unilateral surgical conditions of the kidney. In the first case there was gross hydropyonephrosis of the right kidney associated with calculi of the renal pelvis; before drainage of the suppurating cavity the systolic blood pressure varied between 250 and 220 millimetres of mercury and afterwards the reading was 170 millimetres (systolic) and 110 (diastolic). Later, the affected kidney was removed and the final blood pressure reading was 140 millimetres of mercury (systolic) and 80 to 85 (diastolic). The second was that of a right-sided hydropyonephrosis, which was held to be responsible for a blood pressure of 210 millimetres of mercury (systolic) and 130 millimetres (diastolic) together with marked sclerosis of the retinal vessels; in this case death resulted from hæmorrhage due to rupture of an aneurysm of the left renal artery. A raised blood pressure associated with hydropyonephrosis of the right kidney and hydronephrosis of the left was seen in the third case. The authors suggest that in each case the raised arterial pressure may be due, at least in part, to toxic absorption from the chronic suppurative foci. The observations of Engel (*Cleveland Clinic Quarterly*, 1940, Number 7, page 290) are quoted: here a complete urological investigation of 73 cases of hypertension was made. Of the patients 13·7% had a marked and severe unilateral kidney lesion (ureteric calculi with obstruction, gross hydronephrosis, calculous pyonephrosis, pyelonephritis); seven of the patients were subjected to nephrectomy and four of these had a marked and permanent fall in blood pressure.

Gastro-Intestinal Allergy.

J. WARWICK THOMAS AND CHARLES P. WOFFORD (*The American Journal of Digestive Diseases*, August, 1941), from a review of 134 cases of gastro-intestinal allergy, present the observations made in fifty cases in which this diagnosis was of major significance. The commonest symptoms were eructation, distension, abdominal pain and flatus. The commonest foods incriminated by the patient were cabbage, milk, beans, eggs, chocolate, coffee and wheat. Of the group of patients 90 had associated allergic manifestations. A family history of allergy was elicited in 84% of the cases. In a high percentage of cases diagnosis of an associated gastro-intestinal condition, either organic or functional, was made.

The Treatment of Idiopathic Ulcerative Colitis with Concentrated Liver Extract and Vitamin B_1.

PAUL SHIFFER AND L. KRAEER FERGUSON (*The American Journal of Digestive Diseases*, August, 1941) deplore the recent reintroduction of liver extract in the treatment of idiopathic ulcerative colitis. They report the results obtained in the treatment of twelve patients who were closely and personally supervised during the whole course of treatment. The material used was concentrated liver extract and vitamin B_1 ("Reticulogen", Lilly). A course of treatment consisted of at least ten intramuscular injections of one cubic centimetre. During the first week three injections were given; in the second, third and fourth weeks the patient received two injections weekly, and thereafter when the result was still in doubt, one injection was given every week. The highest number of injections given in one case was 18. No other advice or drugs were given to these patients and no diet was prescribed; however, most of the patients had followed a self-imposed *régime* which years of experience had taught them. Only one patient received any benefit, and that result was not repeated in a subsequent attack. They conclude that the use of concentrated liver extract and vitamin B_1 ("Reticulogen") was of no particular value to the patient and had no specific effect against idiopathic ulcerative colitis.

Electrocardiographic Findings Associated with a Gunshot Wound of the Heart.

WILLIAM A. FRASER AND MEYER TEXON (*The New England Journal of Medicine*, August 21, 1941) report a case of gunshot wound of the heart involving a branch of the artery to the anterior and lateral portions of the left ventricle, that arose from the left circumflex artery. They present the electrocardiographic changes recorded before surgical operation, during the course of operation and after operation. They emphasize that these represent not only the effects of the cardiac injury, but also the attendant complications, which included hæmopericardium, pericarditis, pneumothorax and pleural effusion, as well as trauma incident to manipulation during the surgical procedure.

Some Nutritional Deficiencies in Man.

L. S. P. DAVIDSON (*The Lancet*, August 2, 1941) discusses cases in which a single clear-cut deficiency syndrome may dominate the clinical picture, in the presence of a diet apparently grossly deficient in many factors. Moreover, in patients on apparently similarly deficient diets, the dominant feature in each may differ. Three cases of manifest scurvy in elderly men, three of severe nutritional iron deficiency anæmia in children and three of nutritional deficiency due to failure of intestinal absorption after operations are discussed. Dietary deficiency may result directly from an insufficient intake of the necessary food factors or indirectly from failure in their absorption or because of enhanced demands conditioned by increased metabolic requirements.

Cancer of the Stomach.

W. A. COOPER (*The Journal of the American Medical Association*, May 10, 1941) reviews the histories of 264 patients with proved gastric cancer in order to evaluate the various features of each case and their importance in early diagnosis. Loss of appetite is the most constant early symptom and this is soon followed by fullness after meals, epigastric pain either persistent or intermittent and thus simulating benign ulcer, and flatulence. Unexplained attacks of nausea and vomiting may also occur as early symptoms, but more often are later in the course of the disease; this applies also to weakness and anæmia and loss of weight. If blood is present in the vomitus the disease is likely to be advanced. Abnormal physical signs are usually entirely absent in the early stages. In 75% of cases there is no previous history of gastric symptoms; clinical diagnosis is particularly difficult in the 25% of cases in which gastric symptoms have been present for years. Radiographic findings are of the utmost importance and in the author's clinic give an average 90% of accurate diagnoses when repeated examinations are possible. The gastric analysis is less certain, but a normal or low acid finding was obtained in 85% of cases of gastric cancer; no example of hypoacidity was found in gastric ulcer. Its chief value lies in the differentiation of benign from malignant lesions. Gastroscopy has added another diagnostic weapon; its chief value lies in those cases in which the X-ray examination fails to establish a diagnosis. Since it is apparent that radiography has limitations which increase the earlier the disease is seen, gastroscopic examination will in all probability become increasingly necessary as a diagnostic aid. Occult blood is nearly always present in the stools in gastric cancer, a scirrhous carcinoma providing an exception. Full examination is necessary in any patient over thirty-five years of age and complaining of gastric symptoms. If the symptoms are compatible with cancer and the investigations yield no positive information, repeated examination is considered essential to the welfare of the patients. Surgical treatment is the only line to be considered once the diagnosis is established.

Air-Raid Casualties.

F. BROWN (*The Lancet*, May 31, 1941) describes civilian psychiatric air-raid casualties and their response to treatment. Acute emotional shock causes tremor, dilated pupils and tachycardia with an emotional state and sensitivity to noise. Reassurance and a strong hypnotic, "Nembutal", six grains, with a night in hospital usually enable the patient to return early to normal life. Acute transient hysterical reactions such as a semisuporose state with tremor, hysterical palsy, amnesia and aphonia are relieved by reassurance, thirty grains each of bromide and chloral hydrate repeated, or "Nembutal", 12 grains a day, for two or three days. "Sodium amytal", 0·5 gramme, or morphine, a quarter of a grain, and hyoscine, one one-hundredth of a grain, are also effective. For the first two or three days the patient should be under narcotics; thirteen hours' sleep out of twenty-four should be aimed at. After this the patient should be encouraged to get up and to work in the ward, mix with other patients and assist with other jobs. Assistance in problems associated with the home or with occupation is necessary on discharge from hospital. Psychoneuroses, usually hysteria, develop rarely in those previously free from such symptoms; emotional states, voluble speech, absurd or highly coloured statements, amnesia, enuresis, tremors, headaches and other symptoms develop occasionally. Established psychoneurotics are often not affected to any great extent; long-established anxieties or obsessional states sometimes are more important to the patient than bombs. Psychoses

develop ofttimes in persons previously free from such symptoms, and psychoses recur at times. Established psychotics are usually abnormally unmoved by air raids. Senile dementia is in a few cases precipitated in persons of seventy years or over. It is remarkable that so few people are affected by air raids; the anticipated swarms of hysterics have not appeared.

Pulmonary Fibrosis in Raynaud's Disease.

HARRY LINENTHAL AND ROBERT TALKOV (*The New England Journal of Medicine*, April 17, 1941) report the histories of three patients who suffered from the typical phenomena of Raynaud's disease, subsequently developing scleroderma and pulmonary fibrosis in the absence of any other known ætiological factor. The fibrosis of the lungs ran a course much more rapidly progressive than is usually seen in other types of pneumofibrosis, all three patients dying within three or four years after the onset of the dyspnœa. Post-mortem evidence was unavailable, but in view of other published work with histological examination of small arteries, it was concluded that the fibrosis in these cases was secondary to insufficient blood supply resulting from narrowing of the lumen of the arteries. Matsui has shown previously that the changes in the small vessels characteristic of Raynaud's disease are hypertrophy of the musculature of the media, fibrosis and thickening of the intima and great narrowing of the lumen. These changes were demonstrated in the small vessels of all organs with resulting fibrosis of the parenchyma. Raynaud's disease therefore should not be regarded as limited to the small arteries of the extremities, but as involving the small arteries of the lungs and possibly those of other organs of the body.

Obesity.

JULIUS BAUER (*Archives of Internal Medicine*, May, 1941) discusses the pathogenesis, ætiology and treatment of obesity. He states that the current energy theory of obesity, which is concerned only with an imbalance between intake of food and expenditure of energy, is unsatisfactory, and that the distribution of energy in the body also counts besides the rough imbalance between its intake and output. The adipose tissue is not merely a passive storing place for reserve fat, but is a living and active part of the body with its own physiological and pathological processes. The tendency of the adipose tissue to accumulate fat (lipophilia) varies widely in different parts of the body and also in different persons, and increased lipophilia is as a rule associated with increased hydrophilia (tendency to retain water and salt). The author states that lipophilia is determined and influenced by (*a*) an autonomous, (*b*) an endocrine and (*c*) a nervous factor, and that there is evidence that the adipose tissue of an obese person differs from that of a normal person inasmuch as it has greater lipophilia and resists more a mobilization of fat. He defines obesity as the compulsory tendency toward a marked overweight due to abnormal accumulation of fat by persons who are left alone to their automatic regulations and are not supervised as far as food intake and energy output are concerned; while obesity is a definite metabolic disease, temporary corpulence brought about by artificial feeding or artificial restriction of muscular exercise is not. He further states that the cause of obesity is in a very small number of cases an endocrine disturbance or an alteration of certain cerebral centres, but in the vast majority it is a particular constitution, namely, an abnormal gene or gene complex. An increased appetite with a subsequent imbalance between intake and output of energy is the consequence of the abnormal *Anlage* rather than the cause of the obesity. In the treatment of obesity the author recommends chiefly dietetic measures, water and salt restriction, thyreoid medication, and the increase of muscular exercise. As carbohydrates and fats are likely to be deposited as fat, and proteins are more readily burned and utilized and so stimulate thyreoid activity and possess the greatest specific dynamic action, the diet recommended contains about 1,100 Calories, but no more than 20 to 30 grammes of fat and 85 grammes of carbohydrate; the rest of the diet consists of such proteins as lean meat, fish, cheese and eggs. The intake of salt is restricted to about two to three grammes per day, and the intake of fluids of all kinds is limited as far as possible. Thyreoid extract is administered if no contraindication, such as tachycardia, cardiac insufficiency or a definite hyperthyreoid state exists, and it is recommended that it be given regardless of the presence or absence of hypothyreoid symptoms. The author is of opinion that thyreoid extract must act in these cases not as a substitute for insufficient thyreoid function, but as a stimulant for the oxidative processes and the mobilization of water and salt from the tissues, the basal metabolic rate being of little or no value in deciding whether or not thyreoid should be given. The author advises relatively high doses of thyreoid for four to six days, and a repetition of this "thyreoid push" with intervals of several days' rest from therapy. This method is preferred to the administration of small doses of thyreoid continuously over long periods. The author states that glandular preparations other than thyreoid, with the possible exception of œstrogen in such cases as show clear evidence of ovarian insufficiency, have no effect on the obesity itself, that he has never seen any improvement in obesity from the use of pituitary preparations, and that any effect glandular combinations exert on obesity is dependent on the thyreoid substance contained therein.

Putrid and Non-Putrid Pulmonary Abscesses.

A. S. W. TOUROFF AND H. NEUHOF (*The Journal of Thoracic Surgery*, August, 1941) draw attention to striking differences in response to various forms of treatment between putrid and non-putrid pulmonary abscesses. They conclude that the treatment of acute putrid abscess is essentially surgical. Acute non-putrid abscesses exhibit a very much greater tendency than do putrid abscesses to respond to conservative treatment: where conservative treatment fails surgery is useless or harmful, except in a type of abscess surrounded (like a putrid abscess) by a narrow rim of pulmonary infiltration and causing severe symptoms. Surgical treatment is always indicated, however, when an abscess has perforated into the pleura. The differential diagnosis between putrid and non-putrid abscess depends on the presence or absence of a fœtid odour of the breath or sputum: hence careful inquiry about such an odour must always be made of the patient and every effort must be made by the physician to detect it. The conservative treatment of non-putrid abscess consists, according to the authors, essentially of chemotherapy and repeated blood transfusion: they have not been impressed with the value of therapeutic bronchoscopy and they think postural drainage unnecessary. They admit that there is "at times" a tendency for acute non-putrid abscess to spread in spite of treatment and to terminate fatally and that there is little that can be done to prevent this in the present state of our knowledge, except in the type of abscess amenable to surgery.

Oxygen Requirements of Parachutists.

W. M. BOOTHBY and others (*The Journal of Aviation Medicine*, June, 1941) have made experiments in a low-pressure chamber which demonstrated that an aviator who has to "bail out" at an altitude greater than 25,000 feet may do so with safety only provided that he has a supply of oxygen to carry with him and that his first act in preparing to leave the aircraft is to establish this supply. At an altitude of 35,000 feet an aviator will lose consciousness within thirty to forty seconds if his oxygen supply is interrupted. It takes about thirty seconds to prepare to bail out and it would take about a minute to fall from 35,000 feet to a level (about 20,000 feet) at which without oxygen he might safely pull his rip cord. If he pulled his rip cord just as he left the aircraft it would take him from eight to ten minutes to reach a level where the oxygen would be sufficient to restore his consciousness if he were still alive; but it is probable that the cerebral and cardiac damage resulting from anoxæmia during this period would have been intolerable. The authors conclude that a portable oxygen supply must be in readiness for instant use whenever a high-altitude flight is undertaken.

Tuberculous Pulmonary Cavities Persisting Despite Pneumothorax.

L. ELOESSER (*The Journal of Thoracic Surgery*, June, 1941) points out that tuberculous pulmonary cavities may persist despite artificial pneumothorax either because of fixation by adhesions or because of intracavitary pressure. Cavities held distended by adhesions should change their shape when the patient is put in various positions and when he inhales and exhales. Cavities held open by increased intracavitary pressure should not show these changes. Pneumolysis is not likely to close cavities which do not change their shape with changes in the patient's posture or with inspiration and expiration.

Serum Lipids.

W. D. BLOCK, O. H. BUCHANAN AND R. H. FREYBERG (*Archives of Internal Medicine*, July, 1941) describe investigations on the serum lipids of patients with rheumatoid arthritis and obstructive jaundice. In 1933 Heuch reported the analgesic effect of jaundice in arthritis, fibrositis and sciatic pain; however, he was unable to produce therapeutic jaundice. Thompson and Wyatt noted that the bilirubin in the serum of patients averaged 1·39 milligrammes per 100 cubic centimetres,

compared with 2·06 milligrammes in normal persons. They induced non-toxic jaundice with some benefit by the injection of bilirubin dissolved in sodium carbonate *plus* a solution of the sodium salt of dehydrochloric acid. The investigation now reported revealed that in arthritis the levels of total, free and ester serum cholesterol were normal, total serum lipids were normal in amount and the level of serum phospholipids was slightly elevated. Beneficial effects of jaundice in arthritis are therefore not due to a correction of lipid deficiency. However, in obstructive jaundice the levels of total lipids, of phospholipids and of total and free cholesterol are very high and these may have a beneficial effect in arthritis.

Thrombosis of Deep Leg Veins.

W. C. HUNTER, V. D. SNEEDON, T. D. ROBERTSON AND G. A. C. SNYDER (*Archives of Internal Medicine*, July, 1941) report results of investigations of the veins of the leg in 351 unselected autopsies. Thrombosis was found in the leg veins in 185 cases in this group. All the patients had been bedridden for days or weeks when death occurred. The average age was sixty years. Eleven patients had fatal pulmonary embolism. Forty patients had non-fatal pulmonary embolism; in ten of these cases the occluded branches were large enough to bring about infarction. Thirty-two patients had thrombi in parts other than the leg veins. Thrombosis occurred in the great majority of patients without evidence of phlebitis. The venous thrombosis in the calf occurred almost equally commonly among persons with cardiovascular diseases, infections and cachexias. Of surgical patients 50% and of medical patients 53% had thrombi in the leg veins. The main cause of thrombosis was recumbency and immobility. Active flexion and extension of feet, legs and thighs and deep breathing exercises are preventive.

Tuberculous Pericarditis.

H. HANNESSON (*Tubercle*, April, 1941) states that the most satisfactory treatment for tuberculous pericarditis, in addition to the usual measures used against any active tuberculous infection, consists of paracentesis performed as often as necessary for the relief of cardiac compression, followed by the induction of artificial pneumopericardium. This latter must be done early. Clinical relief is greater and more lasting if the fluid is replaced by air: the reformation of fluid is retarded and the formation of adhesions made less likely.

Hæmorrhagic Pleural Effusion and Underlying Disease.

KURT BERLINER (*Annals of Internal Medicine*, June, 1941) reports the results of an investigation of hæmorrhagic pleural effusion to determine the relative frequency of the underlying diseases. The clinical records of 120 cases were critically analysed, and 33 of the patients were examined *post mortem*; the amount and character of the pleural fluid were noted, and in many cases a record was made of the results of the cytological and bacteriological examination of the effusion. Traumatic cases of hæmothorax, cases of spontaneous hæmopneumothorax, and cases of bleeding as a result of needle puncture were excluded from this investigation. Neoplasms of the pleura were found to be the most frequent cause of hæmorrhagic pleural effusions, 78% or 65% of this series being due to neoplasm. In only one case was the primary tumour situated in the pleura, the remaining 77 cases representing metastatic neoplasms of the pleura, and of these the primary lesion was located in the lung in half of them. Tumour cells were found in 50% of the hæmorrhagic effusions examined, which was the same frequency as that observed in non-hæmorrhagic neoplastic effusions. The author's findings were confirmative of the opinion commonly held that a hæmorrhagic pleural effusion is strongly suggestive of neoplastic disease, but he states that 42 of his cases, or in other words every third case, was not due to neoplasm. The assumption, at once, that such an effusion is caused by a neoplasm, is therefore a serious error. Forty-two, or 35%, of the author's cases, were found to be due to various other causes including sepsis, lobar pneumonia, bronchopneumonia, lung abscess and polyserositis (13 cases); tuberculosis (8 cases); pulmonary embolism (10 cases); pelvic fibromatous tumours (2 cases); leuchæmia (2 cases); Hodgkin's lymphogranulomatosis (1 case); uræmia associated with cardiac failure (1 case); and undetermined causes (5 cases). Tuberculous hæmorrhagic pleural effusions were infrequent (8 cases), and of these four appeared as "idiopathic" pleural effusions, two as part of a tuberculous polyserositis, one in association with cirrhotic pulmonary tuberculosis. In the non-malignant group of cases the most frequent cause of hæmorrhagic pleural effusion was inflammatory disease of the pleura, and the author states that the recognition of such cases is of great prognostic and therapeutic importance. It is the author's opinion, as illustrated by the low incidence in the present series of cases, that hæmorrhagic pleural effusions of tuberculous origin are not very common. In ten cases a hæmorrhagic pleural effusion was the result of pulmonary embolism, a type less well known and frequently overlooked. Eight of these ten cases of pulmonary embolism were cardiac—five of valvular heart disease, two of coronary sclerosis in heart failure, and one of hypertensive heart disease in heart failure. In one of the other two cases the source of the embolus was presumably a phlebitis of the hæmorrhoidal veins; in the other the source was undetermined. The author states that a hæmorrhagic pleural effusion may be the sole evidence of a hidden pulmonary embolus. The author found that the determination of the percentage of polymorphonuclear cells and lymphocytes in the fluid does not aid in the differentiation between malignant and inflammatory conditions of the pleura. The two cases of hæmorrhagic pleural effusion due to lymphatic leuchæmia in this series were characterized by lymphocytic counts much in excess of all those in other cases in this series.

Total Thyreoidectomy in Congestive Heart Failure and Angina Pectoris.

SIM FIELDS BEAM (*Annals of Internal Medicine*, June, 1941) reviews the literature of the subject of total thyreoidectomy for congestive heart failure and *angina pectoris*, and reports the details of a case of congestive heart failure in which the patient was treated by this method with good results, and with a five-year post-operative survival period. He states that total thyreoidectomy for heart failure and *angina pectoris* is a valuable procedure as evidenced from the reports in the literature and his particular case. While better results are reported in *angina pectoris*, the results in congestive heart failure are encouraging and do offer relief to a large percentage of patients. The blood velocity, blood pressure and heart size are little changed by the procedure, but the demands made upon the heart are lessened by the reduction of the metabolic rate, and hence are of considerable help to the failing heart. The clinical record of the author's patient showed her to be intolerant of the post-operative use of thyreoid, inasmuch as anginal symptoms were provoked by its use, and in this connexion the author draws attention to the observation made by Christian that the use of thyreoid for the myxœdematous heart may bring on signs of *angina pectoris*. The procedure is justifiable and deserves particular consideration, especially from the economic and social point of view of the patient, provided the greatest problem of selection of proper cases for this procedure is kept in mind. The author advises that the operation is too radical for any patient who has not been carefully treated first with all proved medical therapy and has not responded satisfactorily. It is then, and only then, that the procedure is justified. In congestive failure, the operation should not be performed on those with any active cardiac lesion or rapidly progressing failure. Active rheumatic heart disease and even latent luetic heart disease are definite contra-indications, as are advanced cirrhosis of the liver, renal damage with evidence of abnormal nitrogen retention, and recent coronary occlusion. In cases of the anginal syndrome, only when the pain occurs with the patient at rest, or when it interferes with the patient's only means of livelihood, should this therapeutic method be contemplated. The pre-operative basal metabolic rate has a significant bearing upon prognosis, and one below −15% offers less chance for relief than one higher, and operation is not advisedly offered when the basal metabolic rate is −20% or lower. After operation, as symptoms of myxœdema develop, small doses of thyreoid are indicated, and it is best to keep the basal metabolic level around −20%. The author concludes that while total thyreoidectomy gives more favourable results in the relief of cases of intractable *angina pectoris*, the results of this procedure in properly selected cases of congestive heart failure justify the operation in this condition also.

The Calcium, Phosphorus and Phosphatase of the Blood.

J. DOUGLAS ROBERTSON (*The Lancet*, July 26, 1941) presents a study of the normal serum calcium, serum inorganic phosphorus and serum phosphatase content in sixty normal adults between the ages of twenty and forty. The mean serum calcium content was 10·4 milligrammes (the range being 9·9 to 11·1 milligrammes). The serum inorganic phosphorus mean content was 3·8 milligrammes (the range being 3·1 to 4·8 milligrammes) and the serum phosphatase 7·2 King and Armstrong units (range 3·5 to 13·5). In fifteen healthy people between the ages of sixty and seventy-eight years the serum calcium and inorganic phosphorus content were not found to be significantly different. The serum phosphatase was found to be slightly raised. A study was made of nine normal subjects. On a calcium intake of 0·1 gramme daily all subjects

were in a negative balance; there was a total calcium excretion of 4·4 milligrammes and a negative calcium balance of 2·5 milligrammes per kilogram of body weight daily. On a phosphorus intake of 0·37 gramme daily all subjects were in a negative balance; there was a total phosphorus excretion of 10·4 milligrammes and a negative phosphorus balance of 3·5 milligrammes per kilogram of body weight daily. The point at which equilibrium between intake and output of calcium took place was 0·45 gramme daily for a 70 kilogram subject (0·45 gramme being the minimum or maintenance requirement of the body). The ideal calcium requirement for an adult is at least 0·7 gramme daily, for a child 1·0 gramme daily and for pregnant and lactating women 1·4 to 2·0 grammes daily.

Spontaneous Pneumothorax Simulating Acute Coronary Occlusion.

ARTHUR M. MASTER, HENRY H. KALTER AND SIMON DACK (*Journal of the Mount Sinai Hospital, New York*, July-August, 1941) present a case of spontaneous pneumothorax simulating acute coronary occlusion. The patient was admitted to hospital with an acute attack of severe squeezing precordial pain, radiating down the left arm. The electrocardiogram showed a pattern suggestive of myocardial infarction. The transient fall in blood pressure, slight leucocytosis and fever also pointed to such a diagnosis. The electrocardiograph changes appeared in the precordial lead and consisted of absence of initial positive deflection (presence of a deep *Q*-4) and inversion of the *T*-4. Such a pattern is characteristic of infarction of the anterior surface of the left ventricle. Undoubtedly, all these changes were due to rotation and displacement of the heart, as on X-ray examination the patient was found to have a left-sided pneumothorax and all electrocardiograph changes disappeared as the lung expanded.

Polyneuritis and Facial Diplegia.

FRANCIS M. FORSTER, MADELAINE BROWN AND H. HOUSTON MERRITT (*The New England Journal of Medicine*, July 10, 1941) present a clinical study of polyneuritis with facial diplegia. They state that there is some doubt that this disease constitutes a true disease entity, but present 26 cases to support this view. There was a death rate of 42% (11 persons) in this series, 72% being females. In all patients motor weakness of the affected limb or part was apparent and usually marked, but sensory changes were of a mild degree only. The deep reflexes were also absent. Respiratory failure occurred in thirteen instances, necessitating the use of the respirator. The differential diagnosis lies between acute anterior poliomyelitis, encephalomyelitis and peripheral neuritis of other origin. The only significant laboratory finding is an increase in the protein content of the spinal fluid.

The Social Basis of the Premarriage Medical Certificate.

JUAN ASTORQUIZA SAZZO (*Revista Médica Latino-Americana*, June, 1941) observes that the family, as an organization in law, forms a social cell upon which collectivity is founded. Marriage originates by the spontaneous exercise of the principle of individual liberty and with marriage free society commences. The State has the right to interfere in the institution of matrimony, not in order to destroy it, but to ensure satisfactory sexual union and a healthy physical condition of the offspring. Sexual union from which procreation is intended should be considered a matter of social importance; upon it the State should impose certain limitations. Unless it does so national effort and funds are dissipated in the upkeep of hospitals, orphan asylums, prisons, penal settlements, deaf-mute institutions *et cetera*. The State, which should control every activity pertaining to the public health, should not be allowed to avoid the responsibility of preventing the birth of subnormal, unhealthy or dangerous individuals; the obligatory pre-nuptial medical certificate is, in this connexion, a sanitary measure of supreme importance.

Chylothorax.

S. J. G. NOWAK AND P. N. BARTON (*The Journal of Thoracic Surgery*, August, 1941) report a case of chylothorax arrested by right phrenic neurotomy. The perforation of the thoracic duct was at the level of the eighth thoracic vertebra.

Secondary Infection in Pulmonary Tuberculosis.

S. V. PEARSON (*Tubercle*, July, 1941) states that there is a wide belief that secondary infection may be responsible for bouts of pyrexia in persons suffering from chronic pulmonary tuberculosis and adds: "It is time this bogy of mixed infection was laid to rest. There is no case for it." He points out that numerous bacteriological investigations of the contents of ordinary and giant pulmonary cavities have failed to demonstrate the presence of organisms other than the tubercle bacillus.

Intrahepatic and Extrahepatic Jaundice.

JERE W. LORD, JUNIOR AND WILLIAM DE W. ANDRUS (*Archives of Internal Medicine*, August, 1941) present a review of the literature on the differentiation of intrahepatic and extrahepatic jaundice. They mention the galactose tolerance test, the estimation of cholesterol and cholesterol ester, also serum phosphatase, the hippuric acid test and the cephalin-cholesterol flocculation test. All of these, they state, are unreliable in the differentiation of intrahepatic and extrahepatic jaundice. They deduce, however, that the hippuric acid test gives a fairly accurate estimation of liver damage. The authors have carried out a series of experiments on patients with hypoprothrombinæmia and jaundice. The technique of the new test is as follows: A sample of blood for the determination of the initial level of plasma prothrombin is drawn, and immediately two milligrammes of menadione (2-methyl-1, 4-naphthoquinone, an analogue of vitamin *K*) is injected intramuscularly. A second sample of blood is taken twenty-four hours later and the plasma prothrombin is estimated. If a rise of 10% or more occurs, then the patient may be considered to have extrahepatic jaundice, and no further estimations need be performed. If the rise is less than 10%, the plasma prothrombin is measured at forty-eight or seventy-two hours afterwards. At this time, a rise of over 15% is probably found in extrahepatic jaundice, and anything under 15% indicates hepatic damage, that is, intrahepatic jaundice. In a series of 28 cases, 10 of which were examples of intrahepatic and 18 of extrahepatic jaundice, the test was almost uniformly accurate.

ORTHOPÆDIC SURGERY.

The Scalenus Anticus Muscle and Shoulder Pain.

LOUIS KAPLAN (*Archives of Surgery*, April, 1941) discusses the relation of the *scalenus anticus* muscle to pain in the shoulder. Pain in the shoulder and arm is often attributed to subacromial bursitis. The pain or hyperæsthesia, originally felt in the circumflex nerve distribution, but later shooting to the neck, the shoulder or along the radial nerve branches to the thumb or forefinger, Codman described as due to a "brachial neuritis" from a sensitization of nerves adjoining the bursa. The author has noticed the similarity between these cases and those of the *scalenus anticus* syndrome. Shoulder pain causes spasm of the muscle of the shoulder girdle and the *scalenus anticus* often takes part. That this is true may be proved by the relief obtained by injection into this muscle of procaine hydrochloride. Referring to the relief of the pain of articular fractures and sprains by local infiltration, the author quotes W. G. Campbell on the role of the sympathetic nervous system in the production of pain, and believes that disturbance of this system has a part in the production of shoulder pain. The *scalenus anticus* muscle is a factor in producing the mechanical brachial plexus neuritis associated with a cervical rib and section of the muscle has been performed on many occasions with resulting relief of symptoms. The same operation has been performed with good results in cases in which the syndrome existed, but with no demonstrable cervical rib. The pain is due to pressure on the brachial plexus, and spasm, increased tension and hypertrophy of the *scalenus anticus* muscle may be responsible. Indirect pressure may be caused by undue elevation of the first rib. It is pointed out that there are sympathetic fibres lying on the inner cord of the plexus. The inciting cause of the syndrome is not clear. Possibly a sprain of the *scalenus anticus* often occurs. The drooping shoulders of advancing age, especially in women, may be a factor in the production of spasm. Calcification in the supraspinatus tendon, arthritis of the shoulder or arthritis of the cervical spine may also be responsible for spasm of the muscle and the appearance of the syndrome. The author describes a method of injecting procaine hydrochloride into the *scalenus anterior* muscle in patients complaining of pain about the shoulder. These were grouped under the headings: *scalenus anticus* syndrome, 10; scalenus syndrome following trauma, 6; subacromial bursitis with adhesions, 12; calcification in the supraspinatus tendon, 3; and other conditions about the shoulder, 3. In all seventy-eight injections were given without serious untoward effects. It was often accompanied by temporary anæsthesia of the cervical sympathetic fibres. Relief of pain was, in many cases, considerable and immediate. The author believes that repeated injections may help to avoid the need of scaleniotomy.

British Medical Association News.

SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held on October 30, 1941, at the Robert H. Todd Assembly Hall, British Medical Association House, 135, Macquarie Street, Sydney, COLONEL W. VICKERS, D.S.O., V.D., the President, in the chair.

"Driving under the Influence."

MR. R. ASHBURNER, barrister at law, read a paper entitled "Driving under the Influence" (see page 102).

ACTING-SERGEANT R. LUCAS read a paper entitled "Driving under the Influence" (see page 103).

DR. JOHN MCGEORGE read a paper entitled "Driving under the Influence" (see page 105).

DR. F. S. HANSMAN thanked the speakers for their papers. He said that they had been interesting and instructive; but he had to admit that those present still felt confused as to what was understood by the expression "driving under the influence of intoxicating liquor". He agreed largely with Acting-Sergeant Lucas, who had said that a distinction had to be made between drunkenness, which had been carefully defined, and the earlier stage at which a person's ability to control a thirty horsepower motor vehicle travelling at a speed of thirty miles per hour was in question. It appeared that they were asked to confine their attention to a state short of drunkenness, and the problem was how to assess that state. As Lord Kelvin had said, "we begin to know something about our subject when we can express it mathematically", so that the first thing they should try to determine was what yard-stick they were to use when assessing whether or not a person was sufficiently under the influence of alcohol to make him a potential menace on the public highways. Dr. Hansman thought that the yard-stick should be the concentration of alcohol in the blood.

The first thing to consider was what happened when alcohol was ingested. They knew that a number of factors influenced the effect of a given dose of alcohol—for example, the concentration of the alcohol consumed, the type of alcohol (whether distilled or fermented), the type of stomach into which it had gone (whether it was healthy and whether it contained food, particularly fatty food) and so on. Dr. Hansman proceeded to give a hypothetical example. He suggested that they imagine a person who, with an empty stomach, took concentrated distilled spirits—one whisky and soda. This contained roughly one ounce of whisky. Fifteen to twenty minutes afterwards, it would have diffused into the blood and tissues and have reached its maximum concentration. It would also be present in the cells of the cerebral cortex, and it was essential always to remember that it was the concentration of alcohol in the cells of the cerebral cortex that determined the effect the alcohol would have. They should leave out the exceptional person and confine their attention to the average normal person; average normal persons would constitute the great majority of people who were not total abstainers. This normal person, after taking one whisky and soda, would be found to have about 30 milligrammes *per centum* of alcohol in the blood. When he was tested by devices which required neuromuscular coordination, he made more errors than before he had taken the alcohol. For example, if he was asked to typewrite or to stop a motor car at a certain signal *et cetera*, he would not do so as efficiently as he would have had he taken no alcohol. Naturally, no one would consider him sufficiently "under the influence" as to be a menace on the road. If the same subject was taken, and was given within the space of fifteen minutes three whiskies and sodas (a "double header" and a "chaser"), it would be found that within the space of fifteen to forty-five minutes the alcohol content of his blood would have reached a figure between 50 and 80 milligrammes *per centum* and to the trained observer changes in behaviour would be apparent. The number of mistakes made in performing coordinated movements would be greatly increased. If people who had consumed this dose of alcohol were experimentally examined, it was found that in the repetition of a test made before the ingestion of alcohol they would make more mistakes. Dr. Hansman remarked that such experimental examinations had been carefully made in other countries; in Australia one always had to rely for experimental data on work done in other parts of the world. Ordinarily a man would make fewer mistakes in repeating a test, as had been shown by the use of suitable controls; but the man who had taken the dose of alcohol mentioned not only failed to benefit by experience, but actually fared worse. This man could still walk a perfectly straight line and could talk rationally and, Dr. Hansman thought, would hardly be considered so much under the influence of alcohol that a charge could be preferred against him whilst he was driving a motor car. The alcohol consumption was now increased by the ingestion of seven or eight whiskies during the course of an hour. The average person would then have a concentration of some 100 milligrammes *per centum* of alcohol in his blood, if he was tested within two hours of the first ingestion of alcohol. If, as had been done in the United States of America, he was made to drive a motor car along a highway and at given signals to stop, turn the vehicle to the right or left or avoid obstacles *et cetera*—in other words, to do things that he was accustomed to do whilst driving a motor car—it would be found that the number of errors he made was greatly increased in comparison with his normal standard. Such a man in the opinion of trained observers was no longer able to drive a motor car safely along a public highway. He was not drunk, and in a general way he would be able to perform the usual tests of the medical man's stock-in-trade quite well. But nevertheless, when he was behind the steering wheel of a motor car, he would not be able to avoid accidents which he normally would have avoided.

Dr. Hansman went on to say that at that stage they were approaching the degree of intoxication to consider which the meeting had been called. They were not concerned with the person who had had one or two drinks, nor with the person who was undoubtedly drunk and whose blood alcohol concentration was well above 150 milligrammes *per centum*; they were concerned with the person whose blood alcohol concentration was between 100 and 150 milligrammes *per centum*. The evidence of numerous impartial scientific observers strongly indicated that it was when the blood alcohol concentration was within this range that driving accidents were prone to occur. It was true that one might instance an exceptional person who would not be influenced although his blood alcohol concentration was within this range; such people were exceptional indeed, probably accounting for less than 1% of the population. If such a person should have an accident while he had such a concentration of alcohol in his blood, then it would be hard luck if a court decided that the alcohol influenced his judgement and brought about the accident.

Dr. Hansman suggested the fixing of a level of alcohol concentration in the blood which incapacitated the vast majority of persons; he said that such a course would do injustice to very few. No one could be convicted who had not had quite a fair number of drinks, and no one who had had too much to drink would escape. It was known how much alcohol per kilogram of body weight it took to give a concentration of 100 milligrammes *per centum*; the amount was one gramme per kilogram. People would quickly learn what limitation to set on their consumption of alcohol if they had to drive a motor car after a convivial evening. Blood was the most satisfactory fluid to use for the purpose of testing. The urine was not particularly satisfactory, since although the concentration of alcohol in the urine secreted varied with the concentration of alcohol in the blood, it was never known how much urine was in the bladder before the alcohol was ingested. Expired air had also been used for testing purposes, but it was subject to too many fallacies. One advantage of the use of blood was that, as the rate at which alcohol was oxidized was known, the blood might be taken within an hour or two after the person's arrest and the concentration of alcohol at the time of his arrest could be calculated.

In conclusion, Dr. Hansman suggested that, in order to solve the problem of trying to understand what was meant by driving under the influence of intoxicating liquor while depending on a few clinical signs and symptoms (which at best were really tests for drunkenness), they should follow the lead of other parts of the world and decide upon a certain range of concentration of alcohol in the blood as the necessary yard-stick. The law could prescribe certain conditions for the taking of the sample of blood, and in order to protect the subject one sample could be sent to the Board of Health for examination and one to an independent analyst. Independent analysts could be licensed for that purpose.

DR. H. R. R. GRIEVE said that those present were grateful to the speakers for presenting a crystallized view of the salient features of the question under discussion. As a medical man with some experience in that type of case, he felt that as a profession they were bound, when giving evidence as medical witnesses, to accept without question what was the law on that particular question. It was not for them to say that the question of a person's capacity to drive a motor car should be considered. The law definitely stated that it should not be considered, and they were bound by that. The law did say, according to His Honour the late Mr. Justice Bavin, that they might consider the defendant's conduct whilst driving the motor car in arriving at a decision

as to whether he was "under the influence" or not. To that extent they should be concerned with his capacity to drive a motor car and with how actually he did drive it; but there it should end. One thing that had impressed him after giving evidence in many cases was that medical men had no common approach to the problem. They were called to a police station (perhaps two hundred of them in a year), they approached the consideration of the question in a number of ways and gave their evidence in a variety of ways, and they stressed various factors. Dr. Grieve thought that they should have some common method of approach, some common standard by which to judge whether a man was or was not "under the influence" according to the law. He suggested as a constructive measure that one of the committees of the British Medical Association should consider the whole question and pronounce upon it, setting out for the benefit of members of the police and the legal profession what it believed to be the essentials of a routine examination of a man charged with driving under the influence of intoxicating liquor. He suggested that the committee should take a number of factors into account. At the court medical witnesses should say that they had covered those particular items of ground. They should say that they had heard the history of the case as told to them by the arresting police officer. Dr. Grieve had found in practice that it was important to do that. They should say that they knew and were prepared to give the details of the history of the case as told to them by the defendant, including such items as the form and quantity of alcohol he had consumed, the period during which he had consumed it, how he was driving the motor car and where, and details of any accident with which he might meet from his own account of it. Presumably they had already had the police account of it. Then they should consider where they could ascertain the history of the defendant's habits, his ordinary way of living, what he usually drank and his general medical history. They should consider his conduct whilst under examination—his speech, his movements, his state of mind, his language and his attitude to various people present at the time of his examination. They should consider the more common physical signs that might indicate alcoholic indulgence—for example, the pupils, the odour of the breath (to which reference had been made), whether the coordination tests were carried out properly, and whether during those tests and the whole of the examination the subject appeared to be making an effort to pull himself together. Medical men were often asked by the police whether or not there was such a thing as "sobering up" in the presence of the police. Dr. Grieve considered that it was important to know whether a man was making a conscious effort to control himself; on the whole, that would seem to indicate that he had been drinking too much. For the reasons stated by Dr. McGeorge, such a man might not "sober up" in those circumstances. It was probably untrue that he could "sober up" so as really to regain control when judged scientifically. As Dr. McGeorge had said, emotion was one of the factors that increased the rapidity of absorption. Dr. Grieve was in agreement with Dr. Hansman's suggestion that two specimens of the subject's blood should be taken, one to be sent to the government analyst and the other to a private analyst. Other tests could be set out by the committee; but if the routine described was followed, Dr. Grieve believed that there would be much less dissatisfaction between the medical profession and the police and a more efficient administration of justice. Dr. Grieve had been impressed by the frankness and clarity of Acting-Sergeant Lucas's paper; he thought that it had done good service to the common cause. At the same time, Dr. Grieve had always felt that a kind of veiled antagonism existed towards the members of the medical profession on the part of the police. It was not because the members of the police force cross-examined them severely; they expected that when they were appearing against them. But the police force was nearly always in fact against the members of the medical profession, for one very strong reason: the police force very seldom called on them to give evidence on its behalf. When medical men went into court, it was for that reason that they were almost invariably against the police. Then the police after a time, as a matter of psychology, could not help feeling that medical men wished to be against them, and that was far from the truth. Dr. Grieve understood that the substantial reason why they were not called more often for the police was that the force had instructions to keep down the expense of prosecutions. Dr. Grieve suggested strongly that that attitude ought to be overcome, and that the head of the department responsible for the control of the police should make due representation to the government that the police should, in cases in which their discretion demanded it, be enabled to call upon medical men to give evidence for them. Dr. Grieve urged upon the police that if they wished medical men to help them, they should call upon them more often.

DR. A. M. DAVIDSON said that he strongly supported the remarks of Dr. Grieve, and he regretted that there seemed frequently to be antagonism between members of the police force and medical men. With regard to the routine examination of persons apparently under the influence of intoxicating liquor, Dr. Davidson pointed out that the handbook of the British Medical Association, which was presented to every new member, contained an excellent method of procedure. In it were set out *seriatim* the points to be considered in the examination of a person under the influence of alcohol. Dr. Davidson always made a report available to the patient, if he so desired, setting out the evidence in detail before expressing any opinion. He thought that was one of the cases in which their administration of justice had been sadly at fault. He did not say that it was the fault of the politicians or the lawyers or the police, but he considered it due to their lack of coordination and cooperation. Dr. Davidson then suggested that every police station should have a form setting out the various details to be considered, so that the medical man might be asked to refer to it when conducting his examination, and so that he might make a full report, as was done for an insurance company; the findings would then be put on record for all time, so that they might be referred to later in court. Frequently the medical examination was made at about two or three o'clock in the morning, when conditions were adverse for remembering detail, and some weeks later (after a period of intervening distractions) one's mind was not in the desired condition for swearing calmly and dispassionately to the detailed findings of the examination. Dr. Davidson thought that the proper authority should immediately take action, without waiting for any committee of the British Medical Association or any other person to find out from appropriate text-books, such as "The British Encyclopædia of Medical Practice" and so on, a list of all the things that should be considered in the making of a decision as to whether or not the patient was "under the influence", and that the form drawn up should provide a distinction between facts and opinions. The facts should be set out first of all and then the doctor's opinion, and as it was known that the opinions of doctors varied, the form might perhaps provide for a variation of opinions by persons considering it—the magistrate and the legal representatives of the defendant, and the police, for example. In Dr. Davidson's opinion that was very important. Medical men were asked to find out the facts (symptoms and signs), and that was often very difficult; but then their opinion, which should be of value, was always an "Aunt Sally" for everybody in the court. Dr. Davidson thought that the saddest part of the present administration, not only in regard to the question of drunkenness, but in regard to accident cases as well; no matter how conscientiously the medical witness arrived at his decisions, the general attitude of the court was that there was someone present wishing to tear the decision to pieces. Dr. Davidson suggested that a great improvement would be effected if the evidence was given in a medical and scientific atmosphere and agreed on before its presentation to the court. It could probably be agreed on beforehand by a meeting with the magistrate and the defendant, and then the evidence given in court could be taken at its full value. That procedure would do away with the present situation, in which the disjointed remarks forced out of medical men by cross-examination were made the subject of all sorts of antagonistic and often contemptuous attacks by members of the legal profession. Dr. Davidson thought that a change in procedure along commonsense lines, such as that he had suggested, would be a great improvement. With regard to the idea of a blood test, Dr. Davidson said that he had yet to encounter any of these subjects who would give consent. Moreover, the question arose whether, if the man was presumed to be "under the influence", his consent could legally be accepted if he gave it. Was he capable of giving consent? A regulation would be needed providing that, in cases in which there was some doubt, the suspect had to give his blood or be considered guilty. It was no use asking for the man's consent; and in that connexion again the regulations were hopelessly out of date. If anything was to be done about a scientific examination of a man's blood, the regulations had to be provide for it to be done in all cases—not only in the rare ones in which the man was cheerfully drunk and would give his consent, but in those in which the man was fighting drunk and would not. It should be made possible to take specimens of blood from him whether he agreed or not. Finally, Dr. Davidson referred to the question of idiosyncrasy. He pointed out that they all knew people who were very susceptible to alcohol. He recalled the case of a medical man during the war of 1914-1918; this man became most objectionable after one whisky. He was the type of person who would immediately throw his arms round the necks of the people nearest to him, so that it was necessary to give him another whisky as soon as possible to put him

to sleep properly. He became "paralytic" after two whiskies. In view of such cases, Dr. Davidson asked how they were to determine the stage at which a man was "under the influence", when he might have admitted to having had half a dozen or more whiskies and yet was still able to drive a motor car safely.

SUPERINTENDENT T. W. HOOPER said that he had been shocked to hear that there was a feeling of antagonism between the medical profession and the police. He hoped that that impression would not gain ground; but he assured those present that, as far as the police were concerned, there was no such feeling. The police had one feeling; they knew that the medical practitioner was invariably called by the patient, and the patient very frequently sent for his family doctor. The police desired to arrive at a correct conclusion, and experience over many years showed that the average sensible, truthful, intelligent policeman was well able to determine when a man was under the influence of intoxicating liquor. Acting-Sergeant Lucas had studied the question deeply, and he had mentioned a point possibly not previously considered by the medical profession—the fact that the law distinctly stated that a man should not drive a motor vehicle whilst under the influence of intoxicating liquor. The police thought that the duty of the medical profession was to ascertain just when a man was under the influence of intoxicating liquor. When the doctor had arrived at that conclusion his duty ended; but the police found from experience that in the astute hands of Mr. Ashburner or some other member of the legal profession one question led to another, and the doctor was eventually induced to express an opinion as to whether or not the defendant was capable of driving a motor vehicle—a question totally outside the doctor's province. The only question to be decided by the doctor was whether or not the man was under the influence of intoxicating liquor. Superintendent Hooper congratulated the three main speakers on their papers. He thought that the views of Mr. Ashburner and Dr. McGeorge would be of great assistance to the Police Department in the future. The police, as sensible men of long experience, knew that any person driving a motor vehicle whilst under the influence of intoxicating liquor was a grave danger to other people, and they must collectively do all they could to stamp out that evil; but they must do it in a correct manner. Dr. Grieve had raised the question as to why the medical profession was not more frequently called upon by the police in the cases under discussion. Superintendent Hooper explained that when a constable accosted a man and deprived him of his liberty, he had first of all to make sure in his own mind that the man was under the influence of intoxicating liquor or that he had committed the offence with which he was charged, whatever it might be. The constable had such a conviction in his mind that the prisoner was "under the influence" that it was not considered necessary to call a member of the medical profession. The constable had no right to arrest a man unless he was fully satisfied that that man was "under the influence" and had committed the offence. Then again, there were in the police stations experienced station sergeants, and specific directions were given to them about persons charged with "driving under the influence". Before charging the person concerned, the station sergeant must be satisfied that he was under the influence of intoxicating liquor and a fit subject for the charge. Superintendent Hooper again stressed the fact that the impression that antagonism existed between the police and the members of the medical profession should not be allowed to gain ground. There was certainly no such feeling on the part of the police; as a matter of fact, they held the medical profession in the highest possible esteem.

SUPERINTENDENT W. TOOLE said that quite a number of points had been raised, particularly by the medical profession. In particular he congratulated Mr. Ashburner on the fair manner in which he had dealt with the question. Dr. Grieve had raised a point concerning the fact that the defendant called the doctor on many occasions and the doctor was hardly ever called by the police. Superintendent Toole said that, as Superintendent Hooper had explained, the police did not call the doctor to examine the defendant on their behalf; therefore the doctor was the defendant's witness and the police at no time endeavoured to "steal the defendant's thunder". Therefore the defendant was entitled to call the doctor as his witness; that being so, the police would be trespassing on the ground of the members of the legal profession by taking away from them their right to call their witness. That was why they did not call the doctor to give evidence on behalf of the police unless they summoned him there for that purpose. With regard to the question of the blood test, Superintendent Toole said that there was no law which would permit blood to be taken from a suspect. Until some provision was made in the statute book that could not be done, except with the consent of the defendant or the person charged. In those circumstances it was a matter for the suspect to decide. Dr. Davidson had rightly raised the question as to whether the doctor would be justified in taking blood for testing from a person who was under the influence of intoxicating liquor and gave his consent. Superintendent Toole said that the matter was beyond him; but the police did not ask for such a test to be carried out. They were satisfied when they charged the person that he was guilty of the offence with which he was charged. Dr. Hansman had referred to the amount of alcohol in the blood. Superintendent Toole wondered how long the alcohol was in the blood before it began to deteriorate or decrease in quantity. He did not understand the position; but he presumed that if a man had five or six whiskies, the amount of alcohol in the blood would increase considerably. He asked how long after the subject had taken the last drink the amount of alcohol in the blood began to decrease. Another question arose: if a doctor was called to a police station to examine a prisoner some two or three hours after he had been charged, would the doctor after performing any test at all be able to state what was the condition of the person three hours earlier?

SERGEANT J. H. J. MAGNAY said that a civilian had aptly described the condition of a man who had recently been charged with driving under the influence of intoxicating liquor. The civilian said: "I have been drunk on many occasions; but that man looked like a brewery, smelt like a brewery and he was drunker than I have ever been". Sergeant Magnay said that he did not know what assistance the medical profession could have given to that man; he was so incapable of driving the motor vehicle that an ordinary civilian bystander could pick him as drunk. He had not been charged with that offence, but merely with the offence of "driving under the influence". Another question arose. When it was suggested that the police call a doctor to submit a man to a blood test, the law did not provide for such a procedure. The law suggested this position—that the police had no right to carry out such a test, and if they did they could possibly be charged with assault. Sergeant Magnay knew of nothing in the law at the present time which stated that a man could be tested in such a manner after he had been taken to the police station. He was there; he was observed; his actions were observed and noted, and later reported to the court. The court then, after consideration of his actions, decided whether he was at the time "under the influence" or not. It was not left to the police alone; the man's actions all along were taken into consideration. The doctor went along about an hour and a half after the occurrence, and the question arose, as Superintendent Toole had pointed out, whether the doctor was in a position to give to the court an account of the man's condition an hour and a half earlier. Sergeant Magnay frankly did not think that he was. He congratulated Dr. McGeorge on his helpful address. He said that Dr. McGeorge had brought him under notice, and that he had had the pleasure of subjecting Dr. McGeorge to cross-examination; it was not an unpleasant task. Sergeant Magnay always liked to cross-examine someone who would give what he considered was a truthful version of the events under discussion. Superintendent Hooper had suggested that the feeling of antagonism that had been spoken of between the police and the medical profession did not exist; Sergeant Magnay assured them that it did not. The police were there to do their duty; the medical practitioner was there as a witness. The police, he hoped, cross-examined in a fair manner. They tried to do their duty, and if such a feeling had crept in, it was not on the part of the police. Sergeant Magnay hoped that they would all arrive at greater cooperation in their work together in the courts. The consultant doctor was called to examine the man, and he subsequently gave his opinion; he had not seen the man before. Sir James Stewart, who was one of the leading men of the medical world as Sergeant Magnay understood, had some years earlier expressed the opinion that the police officer with some years of service and experience was as capable of giving evidence as to whether a man was or was not under the influence of alcohol as was a medical man. If those present respected Sir James Stewart's opinion, then Sergeant Magnay hoped that the feeling that antagonism existed between the police and the medical profession would not again be engendered by reason of their questions on that opinion.

DR. C. C. MCKELLAR referred to four points. He said that he understood that it was an army regulation that a man must not be submitted to tests for drunkenness. He could not see why not, and hoped that someone would elucidate the matter for him. They had all experienced cases of alcoholism in the courts. He asked how often was there a conflict of opinion between the police and the doctor and what was the general legal opinion of the value of medical evidence. With reference to the taking of the patient's

blood, Dr. McKellar presumed that the difficulty could be surmounted at the court if the man's permission for that evidence to be produced was sought.

Mr. R. Ashburner, in reply, said that one thing had struck him in connexion with the suggestion of antagonism between the police and the medical profession in the cases under discussion. He thought that they all had to admit that in at least nine cases out of ten the average experienced policeman was as capable as the average medical practitioner of passing judgement as to whether or not a man was rightly described as under the influence of intoxicating liquor. To him, as a lawyer, that did not go far enough. It was the odd tenth case that was important in the administration of justice. They all wanted to see the roads purged of the menace of the drunken driver; but they did not want to see the law administered in such a way that that tenth man who was innocent would be convicted, and it was surely in that case that the medical man could be of the greatest value. In the odd case, from what Dr. McGeorge had said, Mr. Ashburner thought it must be admitted that the symptoms of some ailment or other could be mistaken for signs of drink. The man who had had one drink that had caused his breath to smell and had then suffered slight concussion through an accident provided a simple illustration. Mr. Ashburner wondered whether the ordinary, average, experienced policeman was capable of judging that one odd case. In his opinion that was the only case that the policeman was not as capable of judging as the doctor, and that was why the defendant should be given the opportunity of having medical evidence on his behalf. Mr. Ashburner admitted frankly that in most cases in which a lawyer was defending a man charged with "driving under the influence", he called medical evidence of the type to which Dr. McGeorge had referred in his paper, dealing with the symptoms of intoxication so that one could argue that the defendant might still only be suffering from concussion or have a touch of diabetes, as the case might be, and one hoped that one might be able to "get away with it". But in the odd case there was a danger of a grave injustice, and it was in that odd case that the defendant needed protection.

Mr. Ashburner went on to say that there was only one phrase in Acting-Sergeant Lucas's paper with which he could not agree, and he did not think that Sergeant Lucas had meant to put it the way he had done. The phrase was: "We must not have any false sympathy for the wrong-doer." That was undoubtedly correct; but it had first to be established to the satisfaction of the court that the man was a wrong-doer. Sergeant Lucas had jumped rather ahead of himself there. Once a man was found guilty of having committed the offence, then no one at all should have sympathy for him; but the first thing was to establish beyond reasonable doubt that he was a wrong-doer. It was just in the odd case that they needed the assistance of the medical profession to give a scientific opinion as to whether or not in fact at the time the person charged was under the influence of liquor. Mr. Ashburner then said that, without any reflection on the hospitality of the New South Wales Branch of the British Medical Association, he was no better informed as to the meaning of the phrase "under the influence" than when the meeting began. He supposed that all those present had their own ideas of when they would say that a man was under the influence of liquor. Probably people present would give different judgements if they all had to judge the same case. It was largely a question of fact, and it was clear from what Sergeant Lucas and Sergeant Magnay had said that the police did not adopt the position that any person who was driving a vehicle and who had had alcohol, no matter how little, could be rightly described as "driving under the influence". More than the mere consumption of alcohol was needed to justify the description of a man as "under the influence"; but once that was past there was no statutory definition, as Sergeant Lucas had pointed out, and Mr. Ashburner thought that they were left with the test that he had put to them in chief—namely, whether the man's physical or mental faculties were appreciably affected by the consumption of alcohol, irrespective, of course, of whether he was capable of driving a motor car or not; that was merely one matter which could be taken into consideration.

Acting-Sergeant Lucas, in reply, said that several interesting points had been brought into the discussion. One was the question of how often there was a conflict between the doctor's evidence and that of the police. Dr. Grieve had almost answered that; he had told them that the doctors were never on the side of the police, but always on the side of the defendant, so that they could accept it that there was almost always a conflict. Dr. Grieve had happily also hit on something that had been overlooked by everyone else, and Sergeant Lucas did not know, but suspected, that Dr. Grieve interested himself keenly in politics. Dr. Grieve had told them that it was the duty of the doctor to follow the law and not to require the law to follow the doctor, and that it was the law that limited the scope of the doctor and firmly fixed his position. The law said that he must find only a certain thing. Sergeant Lucas suggested, and he felt sure that Dr. Grieve had intended to suggest, that the doctor should not sit in judgement on the law; he had to abide by the legislation. Dr. McGeorge had referred to "the liberty of the subject"; there was no more mistaken phrase than "the liberty of the subject", unless it was "freedom of speech". If those present did not agree, let them go outside and criticize the appearance of the first person that came by, and see what happened. Let them try their "freedom of speech" on him. Sergeant Lucas asked what "the liberty of the subject" was. He said that in no circumstances must "licence" be confused with "liberty". He thought that that was what was happening in regard to "driving under the influence". They had arrived at the stage where they had confused "licence" with "liberty". Just as there was no real freedom of speech, there was no real liberty of the subject. The line had to be drawn in the proper place. They had arrived at the stage where they thought that a man was entitled to have his few drinks and go home without being "booked"; that was licence.

Sergeant Lucas went on to say that Dr. McGeorge had referred to tests carried out in America. By way of interest he (Sergeant Lucas) pointed out that only two of the United States of America had blood tests which were permitted by law. No person could be compelled to be tested, and if he declined to be tested the fact could not be offered as evidence against him. If those present considered this, they would see a particularly serious flaw. But that was not all. In one State a man found to have a concentration of 0·15 gramme *per centum* of alcohol in his blood was legally "under the influence"; in the other State a man with that concentration was legally not "under the influence". If that was the position in America, such a position was not desired in Australia. The other States of America, which were deciding what standard to adopt, were not satisfied with either of the standards of the two States to which reference had been made, so that it was obvious that the position in America was far from satisfactory. Mr. Ashburner in his reply had happily agreed that the most severe penalties should be inflicted on convicted persons. He had suggested that Sergeant Lucas had jumped ahead of himself; he (Mr. Ashburner) had said "give him the limit" when referring to penalty. But it would have been noticed that in his paper Mr. Ashburner had eagerly groped for the old Section 556A of *The Crimes Act*—the one according to which the lawyer said to his client: "Even if you do get convicted the only thing you will have to pay is my fee."

Dr. McGeorge, in reply, said that from the medical point of view he did not think there was any real antagonism between the police and the doctor. Sergeant Magnay had mentioned the fact that he had had Dr. McGeorge "on the grille" a few times; but Dr. McGeorge had found that if the medical witness was reasonably fair in his evidence and did not heed too much the wheedling of the legal gentleman by whom he was called as a witness, Sergeant Magnay treated him well. The hand-book to which Dr. Davidson had referred was one that Dr. McGeorge had used very largely in the preparation of his paper. The hand-book of the British Medical Association recommended that the Danish system should be followed in the examination of persons suspected of being "under the influence". Dr. McGeorge understood that the police were instructed not to conduct examinations of persons to be charged with that offence. That of course greatly limited the value of any tests that might be suggested by the British Medical Association. Even if a committee was formed and decided the question and made recommendations, it was doubtful whether the police would be allowed to subject any defendant to those tests. Superintendent Toole had raised an interesting question with regard to the tests for alcohol. Although Sergeant Lucas apparently did not very much appreciate them, nevertheless they were largely accepted throughout the world. To be on the safe side, one usually held that a concentration of 200 milligrammes per 100 cubic centimetres of blood indicated intoxication; but that figure was not taken in any particular instance by itself. It was taken as proof in conjunction with the other signs present, and it should really make the matter simpler, because the medical man could not evade it; the evidence was there. If the alcohol content of the blood was 200 milligrammes *per centum*, the evidence was irrefutable. Superintendent Toole had spoken of the time it would take for the signs to disappear from the blood. The accepted opinion was that the blood could be taken some hours after a person was regarded as being "under the influence". As the rate of metabolism or breaking down of alcohol was known, it could be calculated reasonably well what amount of alcohol was originally in the blood. They had been told that three

whiskies produced a blood alcohol concentration of 60 to 80 milligrammes *per centum*. Dr. McGeorge had made a calculation: if a man's weight was 150 pounds and it was assumed that two-thirds of that weight was body fluid, that would be 100 pounds of body fluid. If it was assumed that 180 milligrammes or 0·18% meant intoxication, then 0·18% of 100 pounds was 0·18 pound or 2·88 ounces—an amount actually less than three whiskies. Thus, if the man admitted that he had had three whiskies and he weighed 150 pounds, by means of calculation it was possible to work out how many milligrammes of alcohol there were in the blood. Dr. McGeorge once more urged those present not to accept the fallacious idea that antagonism existed between the medical profession and the police, even though in the course of their duty they became at times somewhat aggressive. It had to be remembered that the legal profession also had a similar tendency, and after all they were only doing their duty as they saw it.

VICTORIAN BRANCH NEWS.

THE following books have been added to the library of the Medical Society of Victoria (the Victorian Branch of the British Medical Association):

Abrahams, Margery and Widdowson, Elsie M.: "Modern Dietary Treatment", 1937.
"Acta Coventus Tertii de Tropica Morbis", Part I.
"Acta Coventus Tertii de Malariæ Morbis", Part II.
Adam, James: "Asthma and the General Practitioner", 1939.
Albee, Fred H.: "Bone Graft Surgery in Disease, Injury and Deformity", 1940.
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Amor, A. J.: "An X-Ray Atlas of Silicosis", 1941.
Armstrong, Harry G.: "The Principles and Practice of Aviation Medicine", 1939.
Bailey, Hamilton, "Surgery of Modern Warfare", Parts I to V, 1940.
Bailey, Hamilton, and Love, R. J. McNeill: "A Short Practice of Surgery", 1941.
Baldwin, E.: "An Introduction to Comparative Biochemistry", 1937.
Barnard, W. G.: "Elementary Pathological Histology", 1940.
Baynes, H. G.: "Mythology of the Soul", 1940.
Bender, Lauretta: "Visual Motor Gestalt Test and its Clinical Use", 1938.
Bierman, William: "The Medical Applications of the Short Wave Current", 1938.
Bigger, Joseph W.: "Handbook of Bacteriology", 1939.
Blacklock, D. B., and Southwell, T.: "A Guide to Human Parasitology", 1940.
Boenheim, C.: "Practical Child Psychotherapy", 1938.
Bourne, A. W.: "Synopsis of Obstetrics and Gynæcology", 1941.
Brain, Russell: "Recent Advances in Neurology", 1940.
Briggs, E.: "Anatomy of the Sheep's Brain", 1939.
Brown, J.: "Congenital Heart Disease", 1939.
Browne, Francis, J.: "Antenatal and Postnatal Care", 1937.
Bucher-Trumpler, O. H., and Hoffiin Harwatzkf, C. O.: *"Die Biologische Reaktion"*, 1939.
Buckstein, Jacob: "Clinical Roentgenology of the Alimentary Tract", 1940.
Burnet, F. M.: "Biological Aspects of Infectious Disease", 1940.
Butler, Mildred: "Blood Cultures", 1937.
Cade, S.: "Malignant Disease and its Treatment by Radium", 1940.
Cameron, A. T.: "Recent Advances in Endocrinology", 1940.
Cameron, S. J.: "Glasgow Manual of Obstetrics", 1936.
Chalmers, C. H.: "Bacteria in Relation to Milk Supply", 1939.
Chance, Burton: "Clio Medica, Ophthalmology", 1939.
Clark, A. J.: "Applied Pharmacology", 1940.
Clarkson, P.: "Infections of the Hand", 1939.
Clayton, E. B.: "Actinotherapy and Diathermy for the Student", 1939.
"Climatological Atlas of Australia."
Coke, Frank, and Coke, Harry: "Asthma", 1939.
Conybeare, J. J.: "Textbook of Medicine", 1939.
Copeman, W.: "The Treatment of Rheumatism in General Practice", 1939.
Cowdry, E. V.: "Problems of Ageing; Biological and Medical Aspects", 1939.
Crofton, W. M.: "The Cure of Acute and Chronic Infections by Active Immunisation", 1939.
Cruikshank, D. B.: "Tuberculosis, Cancer and Zinc: An Hypothesis", 1936.
Darling, H. C. R.: "Elementary Hygiene for Nurses", 1940.
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National Emergency Measures.

MEDICAL EQUIPMENT.

THE Medical Equipment Control Committee desires to direct the attention of all members of the medical profession to the following information.

Economy in the Use of Drugs.

SIX months ago the Medical Equipment Control Committee circulated to all medical practitioners a copy of the Emergency Formulary of Australia, containing a list of prescriptions of drugs manufactured in this country. This was done in the hope that, by using this formulary, all members of the medical profession would cooperate in an attempt to lessen the consumption of drugs which had to be imported into Australia.

It is most disappointing to find that little or no use is being made of this emergency formulary. The great majority of medical practitioners continue to prescribe proprietary medicines for purposes for which these are not essential, and, in so far as the prescribing of drugs is concerned, seem oblivious to the fact that we are at war.

The wholesale drug firms of Australia, at the instigation of the Medical Equipment Control Committee, have laid in adequate stocks of a limited list of drugs essential for the treatment of all forms of disease, but, in view of the exigencies of the present situation, it is imperative that these stocks should be conserved as much as possible.

The attention of all members of the profession is therefore directed to the following suggestions:

1. Make the fullest possible use of the Emergency Formulary of Australia.
2. Avoid prescribing proprietary drugs except when these are absolutely necessary.
3. Do not order a greater quantity of medicine than is required. An eight-ounce mixture is not invariably necessary, but this quantity is almost invariably ordered. Estimate the number of doses required and prescribe accordingly.
4. Do not order "repeats" unnecessarily.

Correspondence.

TREATMENT OF OSTEOMYELITIS.

SIR: In comparison with Dr. Kent Hughes's case of diaphysectomy for osteomyelitis, before the sulphanilamide era (reported in THE MEDICAL JOURNAL OF AUSTRALIA, July 19, 1941), the following case has some pertinent features.

Baby S., born at Balaklava Hospital on October 19, 1941, developed on its tenth day a brawny swelling of the right thoracic wall, about the breast. It was given a half tablet of "M & B 125" daily. One residual abscess after another was opened in this area, culture showing the organism to be a non-hæmolytic Gram-positive staphylococcus. The sulphanilamide was changed to a tablet of thiazimide daily. At this time an abscess formed in the mother's breast, from which a similar organism was cultured. The last abscess was opened on the baby's twenty-first day and next day a brawny swelling appeared under the left knee anteriorly; deep incision liberated pus from the tibia. X-ray examination three days later showed some rarefaction of the tibial metaphysis. Further openings were required over the tibia and in the popliteal fossa. On the baby's thirty-first day, X-ray examination showed new bone being laid down round the whole diaphysis. Diaphysectomy of the involucrum enclosed necrotic tibia was undertaken, the chemotherapy

was stopped, cod liver oil being substituted. During this time the temperature had kept near to normal, sometimes rising to as high as 101° F. The periosteal cavity was packed with 1 in 1,000 acriflavine in paraffin oil and the limb placed in plaster. There has been no further pus formation. A fortnight after diaphysectomy, a swelling of the left forearm required incision which liberated pus from the ulna. A "Dettol" compress was applied, healing was uneventful, apparently resistance to the organism having been acquired. At the time of writing healing of the leg is not complete. Chemotherapy, in the doses given, neither prevented pyæmia nor altered the course of the osteomyelitis of the tibia, even though it had been given at least a week before that bone was infected; nor was the metastasis to the ulna stopped.

Bick, writing in *Surgery, Gynecology and Obstetrics* of June, 1941 (sulphonetherapy in hematogenous osteomyelitis), concludes:

1. The addition of sulphanilamide, or sulphapyridine, to the treatment of hematogenous osteomyelitis has not significantly altered the general course of bone pathology, rate of recurrences, or metastases.

2. In a series of twenty cases representing all degrees of severity, there was only one death, and that due directly to sulphapyridine. In several instances toxicity was favourably influenced, and the use of the drug was probably the determining factor between life and death.

3. In the treatment of hematogenous osteomyelitis sulfone chemotherapy is not a substitute for surgical judgement, operative technique, or meticulous after-care.

Conclusions one and two are borne out by the course of the infection in Baby S. One waits to see if the tibia of this tiny patient will grow in length.

Yours, etc.,

E. A. JOSKE,

Balaklava,
South Australia,
December 29, 1941.

Naval, Military and Air Force.

APPOINTMENTS.

THE undermentioned appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Number 6, of January 8, 1942.

AUSTRALIAN IMPERIAL FORCE.

Australian Army Medical Corps.

To be Major.—Captain H. A. W. Watson, 29th November, 1941.

To be Captains.—Captains G. A. McLean, 24th November, 1941, and A. F. Smith, 1st December, 1941.

The undermentioned officer is appointed from the Reserve of Officers to a unit of the Australian Imperial Force as from the date and in the rank indicated: *To be Captain.*—Honorary Captain K. Keely, 1st December, 1941.

The undermentioned officer is appointed from the Retired List to a unit of the Australian Imperial Force as from the date and in the rank indicated: *To be Lieutenant-Colonel.*—Honorary Major F. B. Craig, 22nd December, 1941.

To be Captains.—James Holmes Currell, 8th October, 1941 (in lieu of the notification respecting this officer which appeared in Executive Minute No. 202 of 1941, promulgated in *Commonwealth Gazette* No. 239 of 27th November, 1941), and Charles Harold Mansfield, 22nd November, 1941.

Permanent Supernumerary List.

Captain N. F. Freemantle is transferred to the Reserve of Officers (A.A.M.C.) in the 3rd Military District, 19th September, 1941.

AUSTRALIAN MILITARY FORCES.

AUSTRALIAN ARMY MEDICAL CORPS.

Northern Command.

First Military District.

Captain (provisionally) P. W. Hopkins, M.C., is appointed to command a Field Ambulance and to be Major (temporarily), 20th September, 1941.

Captain (provisionally) G. M. Redshaw is transferred to the Reserve of Officers and to be Honorary Captain, 28th November, 1941.

The date of appointment of Captain (provisionally) A. D. Isles, notification of which appeared in Executive Minute No. 212/1941, promulgated in *Commonwealth Gazette* No. 247 of 1941, is amended to read "1st October, 1941".

To be Captain (provisionally).—John Stephen Sullivan, 7th November, 1941.

Eastern Command.

Second Military District.

The provisional appointment of Captain W. R. Frost is confirmed.

The following officers are appointed from the Reserve of Officers (A.A.M.C.), and to be Captains (provisionally) from the dates shown: Honorary Captains K. S. Jones, 20th November, 1941, B. A. Stephen, 24th November, 1941, D. Varvaressos, 26th November, 1941, G. L. Guison, 27th November, 1941, and W. Moppett, 28th November, 1941.

Southern Command.

Third Military District.

Captain H. Shannon is transferred from the Permanent Supernumerary List, Australian Imperial Force, 30th September, 1941, with regimental seniority in accordance with Army seniority.

Captain (provisionally) (Temporary Major) H. A. W. Watson is transferred from Australian Army Medical Corps, 7th Military District, and relinquishes the temporary rank of Major, 29th November, 1941.

Honorary Captain D. J. Oldmeadow is appointed from the Reserve of Officers (A.A.M.C.), and to be Captain (provisionally), 17th November, 1941.

To be Captains (provisionally).—Peter Wallace Marshall and Dudley John William Edwards, 9th December, 1941.

To be Honorary Captains.—Harold John Winterbotham, 6th December, 1941; and David William Neville, Roy Nettleton, Thomas John Knox Jamieson, Percival Leslie McNeil, William Arnold Graham, James Gibson, David Brahan Rosenthal, Ronald Ernest Hearn, Frederick Hilton Wallace and Robert Kerr, 9th December, 1941.

Sixth Military District.

To be Honorary Captain.—Roman Shatin, 8th April, 1941 (in lieu of the notification respecting this officer which appeared in Executive Minute No. 93/1941, promulgated in *Commonwealth Gazette* No. 105 of 1941).

DECORATIONS.

THE Director of Medical Services of the Royal Australian Air Force announces that Squadron Leader J. C. Laver, of the Royal Australian Air Force Medical Service, has been "mentioned in dispatches".

CASUALTIES.

ACCORDING to the casualty list received on January 14, 1942, Captain Charles Stewart Donald, A.A.M.C., of Warracknabeal, Victoria, is reported missing, believed drowned through enemy action.

Obituary.

WILFRID KENT HUGHES.

WILFRID KENT HUGHES was a remarkable man. His sudden death from heart failure in the small hours of the morning was quite unexpected; at the same time he lived so strenuously, never sparing himself or even appearing to take thought of himself, that his friends were not surprised. He was known throughout the length and breadth of the Commonwealth, first of all as an able exponent and teacher in his chosen specialties, for he achieved success in more than one branch of medicine, and also as one who entered fully into the corporate life of his profession and did his utmost to further its welfare in more than one sphere. He was forthright, blunt and, it must be owned, not averse to a quarrel, but he had a charm of manner, he did good by stealth and he was generous, sometimes over-generous, with his professional skill. He was a sharp critic of others, but also a keen critic of his own work, and almost to the day of his death his opinions were offered and valued at meetings of the Melbourne Paediatric Society, whose discussions are always worth while.

Wilfrid Kent Hughes was born at Brighton, Victoria, in 1865. He was the son of Charles William Hughes, a grazier, who came to Australia from England in 1835. His mother was a woman of forceful character, and many a good tale is told of the way she had "roughed it" in the early pioneering days. She was always prominent in the life of the community; her character was reflected in her bearing—in her later years she held herself as straight as a ramrod, by her mere presence she commanded homage and respect, and to be in her presence was an inspiration; it was from her that her sons derived their abiding interest in social reform, in civic affairs and in church life. There were three sons, and each gained eminence in his profession, one in the army, another in the church, and Wilfrid in medicine.

Wilfrid Kent Hughes won an entrance scholarship to the Melbourne Grammar School at an early age and maintained himself by scholarships while he remained at that school. He was *dux* of the school in 1881. He was a prominent athlete and distinguished himself particularly on the running track and in the school football field. He played League football for the Essendon Club at the early age of fifteen years. He was a very slight tall lad, and the barrackers would call: "Watch out for the shadow." He watched over the fortunes of his old club for twenty years, and as medical officer treated dozens of players free of charge, often accommodating them at his rooms in Collins Street. He lost interest in the club only when the professional element crept into the game.

After spending a year at the University of Melbourne, Wilfrid Kent Hughes travelled to England and became a student at Saint Bartholomew's Hospital. It was here that he met his first wife, Miss C. Rankin, who assisted him with translation work for a book on orthopædics which he published in conjunction with Dr. Walsham. He also was a fellow student of the late Henry William Armit, who was later on to become first editor of THE MEDICAL JOURNAL OF AUSTRALIA. Armit and Hughes were to be associated for some years, the one as editor and the other as Victorian director of the company controlling this journal. In 1892 Wilfrid Kent Hughes graduated as Bachelor of Medicine in the University of London; he also gained the diplomas of the Conjoint Board, L.R.C.P. and M.R.C.S. Returning to Australia, he commenced practice at 22, Collins Street, Melbourne, and he occupied these premises throughout the rest of his life. He was a versatile man, and always insisted on carrying on work in two widely different specialties, orthopædics and diseases of the eye, ear, nose and throat. He used to say of his work: "Above the neck and below the knee, why not?" In both spheres he became proficient and in both he enjoyed authority. For about thirty years he served the Royal Melbourne Hospital in the department for diseases of ear, nose and throat, and for the same period he adorned the orthopædic department of the Children's Hospital. At the time of his death he was honorary consulting surgeon of the Children's Hospital. He was for a period orthopædic surgeon at Saint Vincent's Hospital. Senior members of the profession will readily recall the keenness with which he gave demonstrations of his work at interstate gatherings in the early years of the present century, and the interest with which these demonstrations were attended. Throughout most of his active professional life he gave practically every week-day afternoon to hospital practice, and he also took the keenest interest in the practical training of students, holding special classes for them in bandaging and plaster work.

In 1915 he enlisted for service with the Australian Army Medical Corps and left Australian shores as major of the Third Australian General Hospital. He gave vivid accounts of the landing of that hospital personnel on the shores of Lemnos, where there were barely enough tents to shelter them. He saw service on Gallipoli, and after having contracted a severe form of dysentery was invalided to England. After a year of service he was returned to Australia at the end of 1916. Early in 1917 he sailed for England again and went to Petrograd with the British-American Hospital. The hospital was forced to close down during the revolution owing to lack of supplies, and Kent Hughes always insisted that the tales of murder and bloodshed were much exaggerated. Instead of going home with the rest of the personnel, he visited the Bessarabian front and eventually went home by way of Siberia. He arrived in Australia wasted to a shadow. Travellers on the trains were only permitted to carry food in paper bags, and the corridors were packed with soldiers who jumped from the train and devoured everything eatable at the stations before the rest of the passengers arrived. His health was never really robust after this experience.

Wilfrid Kent Hughes was an active member of the British Medical Association and took an active part in the affairs of the Victorian Branch. As Victorian Director of the Australasian Medical Publishing Company, Limited, he was for some years an *ex-officio* member of the Branch Council. He was one of those who worked for the establishment of one medical journal to serve the Australian medical profession, and when the Australasian Medical Publishing Company, Limited, was founded in 1913 to establish THE MEDICAL JOURNAL OF AUSTRALIA, he was one of the first directors. He remained a member of the Board until March 19, 1917, when he retired until August 6, 1918; he occupied a seat on the Board until his final retirement in March, 1929. He had for some years been associated with a printing and publishing company, and he was able on many occasions to ask pertinent questions and to make suggestions at directors' meetings, which were of value either in smoothing out a difficulty or in the making of plans for expansion. In Victoria he was one of the foundation directors of the British Medical Insurance Company, which has been of such signal service to Victorian members. In earlier years he took part in Branch discussions and attended many of the Australasian congresses. At the Dunedin congress in 1927 he was Vice-President of the Section of Orthopædics. One of his chief interests, particularly in later years, was the Melbourne Pædiatric Society, and "Kent" as his colleagues generally called him, often, as already stated, made useful contributions to discussions. Outside of his own profession he was active. On two occasions he sought election to the Victorian State Parliament, but without success. He was for some years, however, a member of the Melbourne City Council and devoted much of his time and energy to the care of Melbourne parks and public gardens and to the creation of children's playgrounds. Gardening was always his hobby, and of all flowers native wattle was his favourite. In his garden at Warrandyte, on the banks of the Yarra River, he grew no less than seventy-two varieties of wattle. Nothing made him more furious than to see young vandals despoiling the blooms on the river bank. He was a keen educationist and was the prime mover in the establishment of Trinity Grammar School, Kew, though nothing made him lose his affection for his own Melbourne Grammar School. Of the latter he was for years a member of the school council. He fought hard to cut down the hours of home-work for children, and he held the view that a year's rest from study was necessary between school and university life. He had ten children, seven by his first wife and three by his second. He always held before his eight daughters the ideal that matrimony and motherhood are woman's finest destinies, but he trained each one to earn her own living. Six of his ten children are graduates of the University of Melbourne, and one daughter and a son are members of the medical profession. All ten children are living. His third wife holds a commission in the Royal Army Medical Corps.

Wilfrid Kent Hughes had a warm-hearted and impulsive nature. He was always an optimist in his work and in business life. He quarrelled with people, but could do so without rancour. One medical woman tells how in the midst of a heated argument in which legal action was threatened, she received a box of flowers from him with his compliments! Many people did not understand him; some did not try, but those who did were rewarded and will carry with them the memory of an able and generous man who adorned his profession.

Dr. H. Boyd Graham writes:

I lost one of my heroes when Wilfrid Kent Hughes died. His prowess in the football field is one of my early memories. He was contemporary with my father at football with the Essendon Club, and I have often listened open-mouthed to some tall tales of his extraordinary speed, talent and gameness. In my father's company I met him frequently and was attracted by his picturesque language and downrightness.

When I came to work with him at the Children's Hospital just after the last war he revealed one of his characteristics by recognizing me as my father's son and therefore entitled to his friendship and assistance. In the years that have intervened I have been honoured by a continuation of that friendship and was fortunate enough to retain it to the end.

Those of us who knew him in his heyday have been saddened to see him growing old, for he was not made to be old. He was ever ready to stand up vehemently for his friends and his views, and challenged all and sundry in very youthful fashion. He had a zest for discussion and action, and was a lifelong adherent to the motto of the "Same Olds", which runs: *"Suaviter in modo, fortiter in re"*.

His professional keenness was a byword, though many people who did not know him well enough to benefit from his great kindness and to recognize his stirling qualities and sincerity were liable not to understand his motives.

The members of the Melbourne Pædiatric Society were greatly impressed by the sincere and generous tribute to its progress which Dr. Kent Hughes made quite spontaneously at the meeting on October 8. His words have become more

poignant now that he has passed over to the company of his great colleagues. They were the last of many contributed to discussions at clinical meetings, and in the light of what happened exactly one month later it is difficult to escape the feeling that they were inspired by some sense of the impending end of an unusually long and brilliant career.

JOSEPH SYDNEY DICKSON.

We regret to announce the death of Dr. Joseph Sydney Dickson, which occurred on January 11, 1942, at Mosman, New South Wales.

THE BARBARA MORTIMER THOMAS MEMORIAL FUND.

BARBARA MORTIMER THOMAS was one of the four staff masseuses of Saint Thomas's Hospital, London, who died in September, 1940, as a result of bomb injuries received in the severe air raids at that time. Her courage at that time won world-wide admiration and drew attention to the splendid work she had achieved for mothers and babies, and called forth this tribute from the rescue squad who toiled sixteen hours to save her life: "Australian—A True Briton".

Barbara Thomas, who was educated at the Presbyterian Ladies' College, Pymble, and the University of Sydney, first went to London in 1930 as a member of the Australian women's hockey team and remained to study massage at Saint Thomas's Hospital. After a distinguished student career she gained first place in England for anatomy and was seventh in the aggregate in her final examinations; she joined the staff of the hospital and became chief assistant and demonstrator in the department of physiotherapy under Sister M. Randell.

When she came to Australia for a holiday in 1938 she gave her services voluntarily to the Department of Public Health to make a film of the pre-natal and post-natal exercises as established at Saint Thomas's. This film is now in wide use in New South Wales and other States.

Upon her return to London, Barbara Thomas assisted Sister Randell in the preparation of her book "Training for Childbirth, from the Mother's Point of View", the second edition of which has just been published and is dedicated to Barbara Thomas. In the preface Sister Randell writes:

> The many mothers she helped, both in this country and in Australia, will remember her radiant personality and cheery optimism, as well as her sympathetic understanding of their difficulties and needs. Her sincerity, charm of manner, keen sense of humour, perseverance and determination were an inspiration to all her patients, who quickly forgot doubts and fears in a calm and happy atmosphere of hope, confidence and courage.

A further tribute was paid to Barbara Thomas in *The Times*:

> Many visitors to the hospital, people of all classes alike, will remember the confidence, the courage and the joy she imparted to all who came under her care. The blotting out of a bright young life so full of promise and accomplishment will to many seem one of the bitterest tragedies, or rather crimes, of the war.

A memorial fund has been established in London to the memory of the four masseuses, to take the form of scholarships for training masseuses, and that in memory of Barbara Thomas is to benefit Dominion students. Barbara Thomas's friends will know that this form of memorial is one which she herself would have desired above all others.

The committee in London has written to personal friends in Australia asking them to obtain contributions for the fund. A committee has been formed in Sydney. Contributions may be sent to the honorary secretary-treasurer, Miss Kathleen M. Commins, 21, Tunks Street, Waverton, New South Wales. The committee consists of Professor J. C. Windeyer (Chairman), Dr. Grace J. Cuthbert, Miss Katherine Ogilvie, Miss Barbara Munro, Miss Kathleen M. Commins.

Books Received.

"Seasonal Influence on Growth Function and Inheritance", by A. B. Fitt; 1941. Wellington: New Zealand Council for Educational Research. Demy 8vo, pp. 193, with diagrams. Price: 10s. 6d. net.

"Royal Prince Alfred Hospital Diet Manual"; 1941. Sydney: Royal Prince Alfred Hospital. Demy 16mo, pp. 220 (interleaved), with charts and tables.

Nominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Hartley Smith, Frances, M.B., B.S., 1941 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.
Keller, Walter Lloyd Holcombe, M.B., B.S., 1941 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.
Royle, Harold George, M.B., B.S., 1941 (Univ. Sydney), Royal North Shore Hospital of Sydney, St. Leonards.

Diary for the Month.

JAN. 30.—Tasmanian Branch, B.M.A.: Council.
JAN. 23.—Queensland Branch, B.M.A.: Council.
JAN. 28.—Victorian Branch, B.M.A.: Council.
FEB. 4.—Western Australian Branch, B.M.A.: Council.
FEB. 5.—South Australian Branch, B.M.A.: Council.
FEB. 10.—Tasmanian Branch, B.M.A.: Branch.
FEB. 13.—Queensland Branch, B.M.A.: Council.
FEB. 18.—Western Australian Branch, B.M.A.: Branch.
FEB. 26.—South Australian Branch, B.M.A.: Branch.
FEB. 27.—Queensland Branch, B.M.A.: Council.
FEB. 27.—Tasmanian Branch, B.M.A.: Council.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmain United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phœnix Mutual Provident Society.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-3.)

Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this journal. The management cannot accept any responsibility unless such a notification is received within one month.

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